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CATEGORIZATION BEHAVIOR AND ACHIEVEMENT IN DEAF AND HEARING CHILDREN.

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DESCRIPTORS- *CLASSIFICATION, *COGNITIVE PROCESSES, *ACADEMIC ACHIEVEMENT, *DEAF, *COGNITIVE TESTS, CHILDREN, ADOLESCENTS, TRIPLE MODE TEST OF CATEGORIZATION, NEW YORK CITY

THE TRIPLE MODE TEST OF CATEGORIZATION (TMT-CAT), A COPY OF WHICH IS INCLUDED WITH THIS DOCUMENT, WAS CONSTRUCTED AND VALIDATED TO MEASURE THREE MAJOR MODES OF CATEGORIZATION POSTULATED BY VYGOTSKY. THE TMT-CAT CONTAINS 131 TEST ITEMS WHICH ARE PICTURES IN FORCED-CHOICE-PAIR COMPARISONS. THE CHILD MUST INDICATE PLACEMENT OF A STIMULUS PICTURE IN ONE PICTURE OF THE PAIR. PAIRED PICTURES REPRESENT THREE CATEGORIES--SUPERORDINATE, FUNCTIONAL, AND ASSOCIATIVE. THIS INSTRUMENT, ALONG WITH THE STANFORD ACHIEVEMENT READING TEST, WAS ADMINISTERED TO 313 HEARING CHILDREN, 225 TYPICALLY DEAF CHILDREN, AND 27 SPECIAL CLASS DEAF CHILDREN, TO DETERMINE WHETHER THE DEAF EXHIBIT SIMILAR MODES AT THE SAME DEVELOPMENTAL LEVELS AS HEARING CHILDREN. MODES OF CATEGORIZATION WERE STUDIED AT DIFFERENT ACHIEVEMENT LEVELS OF DEAF AND HEARING CHILDREN TO DETERMINE WHETHER THESE MODES CONTRIBUTE TO DIFFERENTIAL SCHOLASTIC ACHIEVEMENT. CATEOGRIZATION SCORES OF ALL CHILDREN WERE ANALYZED BY FACTORIAL ANALYSES OF VARIANCE AND THROUGH CORRELATION ANALYSIS. DIFFERENT DEVELOPMENTAL PATTERNS WERE OBSERVED IN THE CATEGORIZATION MODES OF DEAF AND HEARING CHILDREN. WITH INCREASING AGE, SUPERORDINATE AND ASSOCIATIVE RESPONDING DECREASED, WHILE FUNCTIONAL RESPONDING INCREASED IN DEAF CHILDREN. WITH INCREASES IN GRADE AVERAGE, SIMILAR RESULTS WERE OBTAINED. FOR HEARING CHILDREN, INCREASING AGE WAS ACCOMPANIED BY INCREASED SUPERORDINATE RESPONDING, DECREASED ASSOCIATIVE RESPONDING, AND STABLE FUNCTIONAL RESPONDING. THIS SAME PATTERN EMERGED FOR GRADE AVERAGE AND MODES OF CATEGORIZATION. WHEN DEAF AND HEARING CHILDREN WERE MATCHED EXACTLY ON READING ACHIEVEMENT SCORES, ALL DIFFERENCES IN CATEGORIZATION BEHAVIOR DISAPPEARED BETWEEN THESE GROUPS. SIMILARLY, WHEN SPECIAL CLASS DEAF CHILDREN WERE MATCHED WITH THEIR READING ACHIEVEMENT COUNTERPARTS IN THE REGULAR CLASSROOMS, NO DIFFERENCES WERE OBSERVED IN THE CATEGORIZATION BEHAVIOR OF THESE GROUPS. VYGOTSKY'S MODEL WAS PARTIALLY CONFIRMED BY THE RESULTS. THE RESULTS ALSO SUGGESTED THAT DIFICIENCIES IN CATEGORIZATION BEHAVIOR MAY CONTRIBUTE TO DEFICIENT LANGUAGE PERFORMANCE IN THE DEAF CHILD. INCLUDED IS A LIST OF 13 REFERENCES. (AUTHOR)

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INTRODUCTION

The basic limitation imposed by deafness is that all forms of communication are depressed. The deaf child has a difficult task in deriving information from the procession of lip movements and actions which he sees.

Developmentally, the strain of processing information is reduced when a child masters the art of grouping or categorizing stimuli. Inhelder (5) makes the observation that the formation of classes makes possible and facilitates all types of symbolic manipulation, including linguistic. Grouping stimuli into classes occurs in all children as witnessed by their growing command and use of language. Vygotsky's thesis (13) that language itself is a system through which many stimuli are given the same generic name serves as the basis of this investigation, since it is conceivable that the deaf child's limited use of and gains in language reflect an inability to categorize the stimuli he experiences. At best, this language retardation may indicate a developmental lag in the deaf child's attainment and usage of the principle of superordinacy.

When language is removed as an indicator of cognitive functioning, no differences emerge between deaf and hearing children in basic psychological abilities, such as memory, recall, concept formation, etc. (3, 10). In the present investigation categorization tasks are presented nonverbally in order to avoid penalizing the deaf child for his inadequate communication skills. Categorization behavior has been studied infrequently in deaf populations, the major work in this area being conducted by Kates and his colleagues (6,7,8), who found deaf children's categorizations to be as adequate as those of hearing children of the same academic status, although the deaf children's verbalizations of the grouping principles were decidedly inferior to those of hearing children.

The present investigation represents the first step on an evolutionary scheme which may be summarized as follows: 1) How does the deaf child categorize stimuli? Is his mode of categorization the same as that of a hearing child? 2) How does his categorization behavior relate to his academic status? 3) If he categorizes his world in the same fashion as the hearing child, why doesn't he order the verbal symbolic world in the same way?

The specific hypotheses tested, and the rationales, are:

1a. There is a greater relation between high achievement and superordinate responding than between low or average achievement and superordinate responding. High achievers give more superordinate responses than the other achievement groups.

Language plays a large part in achievement tests, and since language presumes the use of the principle of superordinacy as postulated by Vygotsky (13), this relation is expected.

1b. There is a greater relation between average achievement and functional responding than between high or low achievement and functional responding. Average achievers give more functional responses than the other achievement groups.

Prior to the attainment of class concepts, the child passes through a stage where he forms collections of objects sharing some common attribute. This grouping, in Vygotsky's framework (13), is usually performed on the basis of function. The expectation is that the average achievers do not make maximum use of the principle of superordinacy and are therefore at the stage of forming functional categorizations of stimuli.

1c. There is a greater relation between low achievement and associative responding than between average or high achievement and associative responding. Low achievers give more associative responses than the other achievement groups.

This group would be distinguishable from the others by their lack of higher categorizing strategies, and would tend to form what Bruner (1) refers to as collections. This implies categorization of stimuli which are contiguous in time and space, but which are not criterial to identification of class objects or functions.

2a. Older children (148-179 months of age) give more superordinate responses than young (84-115 months of age) or middle aged (116-147 months of age) children.

2b. Middle aged children give more functional responses than younger or older children.

2c. Young children give more associative responses than middle aged or older children.

Cognitive processes undergo progressive maturation and as such follow developmental guidelines suggested by Piaget (9) and Vygotsky (13).

3. Deaf children use less superordinate, more functional and more associative categories than hearing children.

Reviews of the literature (3,10) point to a developmental lag in deaf children with their performance being at a more immature level than their hearing peers.

METHOD

Test Construction

The categorization test, consisting of 50 pictorial stimuli and 300 pictorial backgrounds, was constructed on the basis of Vygotsky's and Bruner's categorization systems. The principles used in drawing the backgrounds were those of superordinate, functional and associative. Each stimulus was placed above six pictorial backgrounds, two backgrounds per category, with a box drawn in each background, where the stimulus might be placed. All items and pictorial backgrounds were randomly positioned within a set and in relation to other sets.

Content Validation

The test was administered to fourteen psychologists with the following instructions: "As an expert, you are being asked to assign a categorization principle to each one of the pictorial backgrounds in the test. Please write in each pictorial background what principle you believe is involved when a child places the stimulus object into that particular item." The content validity of the test was determined by analyzing the principles for each item given by the psychologists. Designation of items as superordinate, functional or associative was based on the criterion of 8 out of 14 psychologists agreeing on the categorization principle.

Final Instrument

The Triple Mode Test of Categorization was a pair comparisons instrument, with each item presented in a forced choice pair comparisons situation. A random number table was used in assigning each item to a page, a position on the page (1-4) the pair (superordinate, functional, associative) and its placement (left or right of the stimulus). This random procedure was modified slightly to assure equal numbers of categories in each half of the test. There were 42 representatives of each category (superordinate, functional, associative) in each half of the test.

Population

The sample of typically deaf children consisted of 225 children, 64 from the Marie H. Katzenbach School for the Deaf, West Trenton, New Jersey, 91 from the Pennsylvania School for the Deaf, Philadelphia, Pennsylvania, and 70 from the Lexington School for the Deaf, New York, New York. The children ranged in age from 7:0 years to 14:11 years, with a mean age of 11:2 years. All children had at least a 65 dB loss in the better ear (average of the three speech frequencies, 500, 1000, 2000 cps), had become deaf prior to three years of age, and had no secondary disabilities; all were within the normal range of intelligence (as determined by the last administration of a standardized intelligence test) and the sample was defined as middle class (as determined by rating the socioeconomic status of the family breadwinner on the Hamburger Scale (4).)

One group of children in special classes was tested at each school. Twelve children comprised the special class group from the Katzenbach School, six children from the Pennsylvania School and nine children from the Lexington School. All of these children met the same criteria as the typically deaf children with the exception that they were placed in these classes by virtue of their exhibiting some learning disability which hindered their progress in the normal classroom.

Three hundred and thirteen children com--prised the sample of hearing children, and were drawn from Birchwood and O'Brien Schools in Rockaway Township, New Jersey. The children ranged in age from 7.0 to 14.11 years with a mean age of 10.8 years, all were within the normal range of intelligence (as measured by the last administration of a standardized intelligence test) and the sample was defined as middle class (on the basis of the Hamburger Scale).

Administration of Instruments

Two instruments, the Triple Mode Test of Categorization, and the Stanford Achievement Reading Test (1963 Revision) were administered to children in groups on two separate days, with intervals of from one to three days separating the testing sessions.

Categorization Testing

Deaf children were tested in groups of from 5 to 32, either in the regular classroom, or in a study hall equipped with chairs and tables. An oaktag poster containing a demonstration item (taken from the first page of the test), was taped to a blackboard at the front of the room. All children were seated so that they could see the tester. The directions were given orally, and when necessary in sign language. "This is a test to see how you think. Look at this picture (tester points to the orange). What is it? (Pause for correct reply). Where do you think it belongs? Do you think the picture belongs here? (pointing to the left-hand box - the fruit bowl)? Do you think the picture belongs here (pointing to the right-hand box - the boy sitting at the table)? Where do you think the picture belongs?" At this point a child was called up to the blackboard and asked, "Where do you think the picture belongs?" After he had made a choice, he was instructed to put an X in that box using a red laundry marker. The examiner then rubbed the mark out and another child was called to the blackboard and the question, "Where do you think the picture belongs?" was repeated. If he chose the other box, the tester said, "You see, there is no right or wrong answer. You put an X in the box where YOU think the picture belongs." If, however, the second child chose the box picked by the first child, the tester asked the children as a group, "Do you all agree?" There was at least one child in all but one testing group who came up to choose the other box. In the one group where all the children agreed with the first child, an assisting teacher came up and indicated that he thought the orange belonged in the other box. The tester added, "Not everybody thinks alike. There is no right or wrong answer on this test. You put an X in the box where YOU think the picture belongs." All children were then instructed to do the practice page and then stop. The tester walked around the room checking to see that each child put only one X for each set of pictures. They were then individually instructed to complete the entire booklet.

All children were given ample time to complete the entire booklet and every child tested did complete the test. No time limits were used, though the older children took approximately 30 minutes to complete the test, while the younger children took about 45 minutes.

Hearing children were tested in the regular classroom in groups of approximately 25. The demonstration poster was placed on the front board as it had been for the deaf children. All instructions were exactly the same for the hearing children with the exception of sign language. Young hearing children completed the test in about 45 minutes, older children in about 30.

Achievement Testing

The same testing situation used for the categorization testing was followed for the administration of the Stanford Achievement Reading Test. The tester wrote the names of the tests on the board with the time limits alloted to each alongside. The sample items for each test were read and signed to the deaf children, but the only instruction which was used was, "Find the right word or words." This was written on the blackboard.

After the instructions were given, the lights were flashed and the sign "go" given. At the end of the standard time limit, the lights were flashed and the sign "stop" given. The children were then given a few minutes to rest, and were then instructed to turn to the next test. The tester read and signed sample items to the children. The lights were flashed and the sign "go" given, at the end of the standard time limit the lights were flashed again a and the sign "stop" given. With the exception of sign language the same situation was used for the hearing children.

Scoring

The categorization test was scored on a separate grid sheet. The number of responses was tabulated separately for each category. A maximum score of 42 was possible for any category.

The achievement test was scored using the hand scoring keys accompanying each form. The child's raw score was converted into a grade score equivalent.

Treatment of the Data

Descriptive Data

The children were first divided into two groups, deaf and hearing. The total age range was divided into three, forming three age divisions, 84-115 months of age, 116-147 months of age and 148-179 months of age. Means and standard deviations were obtained separately for deaf and hearing boys and girls for the variables of dB loss (for the deaf sample only), socioeconomic status, and grade average; means and standard deviations for these variables were also obtained separately for each school for the deaf. Simple t tests were employed to make comparisons among these groups on the variables.

Factorial Design

For each group, deaf and hearing, and each age division, the grade point averages were summed, means and standard deviations obtained. Each child's grade score was then transformed into a standard score equivalent (z). Those children with z scores between ±.75 were designated as average achievers, children with z scores less than -.75 were designated as low achievers, and children with z scores higher than +.75 were designated as high achievers.

A 2X3X3 unequal N analysis of variance was executed separately on the categorization scores of both deaf and hearing children (using two groups, deaf and hearing, three age divisions, 84-115, 116-147 and 148-179 months of age, and three achievement levels, high, average and low).

Smaller factorial analyses of variance (3X3X3 and 2X3X3 were performed for the deaf samples (three schools, 3 age groups, three achievement levels) and separately for each school for the deaf and hearing children (two groups, deaf and hearing, three age divisions and three achievement levels). The first of these analyses were in the form of unequal N analyses of variance, while the latter were in the form of equal N analyses for matched pairs (matched on exact reading achievement scores).

Comparisons of individual cell means were made using the Scheffé technique for comparing means (11).

Correlational Design

Correlation matrixes were established for total deaf and total hearing samples, and for each deaf sample, using 28 variables on which information had been obtained, such as numbers of each category chosen, age, grade average, sex, dB loss, socio-economic status, etc.

Reliability and Validity (of Triple Mode Test of Categorization)

Split-half Reliability

Correlations were performed between the superordinate scores of parts 1 and 2, functional scores, parts 1 and 2, and associative scores of parts 1 and 2, separately for the total deaf and total hearing samples.

Validity

Validation of item analysis through internal consistency was performed separately for deaf and hearing groups and the combined group using Flanagan's r. For each category, superordinate, functional and associative, the scores were ranked from high to low. The upper and lower 27% of these scores were chosen for item analysis. For the deaf sample, 61 papers were chosen to represent high and low scorers in each category, for the hearing sample, 84 papers constituted the high and low groups for each category. Acceptance or rejection of items was based on the combined group of 145 papers in each high and low group for each category. The number of choices representing each category was summed separately for the high and low groups, and converted into percentages which were then located in the r table (12).

RESULTS

Descriptive Data

The results of the t tests between deaf boys and deaf girls, on the variables of age, socio-economic status, and dB loss, revealed no significant differences. Similarly no significant differences were found between hearing boys and hearing girls in either age or socioeconomic status.

Significant differences were found among the three schools for the deaf in grade average, between schools 1 and 3 and 2 and 3; no significant differences in grade average were found between schools 1 and 2.

Analysis of Variance

Superordinate

Significant F ratios were found between deaf and hearing children, between children at different achievement levels, between children at different age levels, as well as significant interactions of hearing status and achievement and hearing status and age. The analysis of variance table for superordinate responses is shown in Table I.

Table 1. Analysis of Variance Table for Superordinate Responses of Deaf and Hearing Children.

Source	Degrees of Freedom	Mean Sum of Squares	F
Achievement	2	1109.78	9.61**
Deaf/Hearing	1	6420.41	55.60**
Age	2	642.49	5.56**
Achievement x Deaf/Hearing	2	960.96	8.32**
Achievement x Age	4	42.37	.37
Deaf/Hearing x Age	2	1430.13	12.39**
Achievement x Deaf/Hearing x Age	4	115.20	1.00
Within	521	115.47	
Total	538	138.48	

**Significant beyond the .01 level.

A table of means was prepared and comparisons performed using the Scheffé technique. The results of the Scheffé comparisons indicated that deaf low achievers gave more superordinate responses than deaf average achievers (Mean of 36.65 compared with a Mean of 28.62). Deaf low achievers gave more superordinate responses than deaf high achievers (Mean of 36.65 compared with a Mean of 25.95). Deaf average and high achievers did not differ from one another in these means. These results are contrary to the hypothesis that superordinate responding increases with grade average. None of the achievement groups differed in the hearing sample (Means of 22.73 for low achievers, 21.61 for average achievers and 22.68 for high achievers). Again, these results are contrary to the hypothesis. The hypothesis that high achievers give more superordinate responses than the other achievement groups is not confirmed.

Deaf children at ages 84-115 months of age gave more superordinate responses than either deaf children at 116-147 months of age, or 148-179 months of age (Mean of 36.41, compared with Means of 25.65 and 29.15) though deaf children of 116-147 months of age and 148-179 months of age did not differ frmm each other. Hearing children at these ages did not differ from one another in superordinate responding (Mean of 84-115 months of age group was 20.99, Mean of 116-147 months of age group was 22.95, and Mean of of 148-179 months of age group was 23.08.) The hypothesis that older children give more superordinate responses is not confirmed. The comparisons between deaf and hearing children of the same achievement level produced two significant findings. Deaf low achievers used more superordinates than hearing low achievers, and deaf average achievers used more superordinates than hearing average achievers; deaf and hearing high achievers did not differ from one another.

The comparisons between deaf and hearing children at the same age levels also produced two significant comparisons, deaf children at 84-115 months of age used more superordinates than their hearing peers; deaf children at 148-179 months of age also used more superordinates than their hearing peers, while at the middle age level (116-147 months of age) deaf and hearing children did not differ. The hypothesis that deaf children use less superordinates than hearing children is not confirmed.

Functional

A similar pattern of significance emerged from the analysis of variance for the functional category. Significant F ratios were found between deaf and hearing children, between children at different age levels, as well as significant interactions of hearing status and achievement and hearing status and age. The analysis of variance for functional responses is shown in Table 2.

Table 2. Analysis of Variance Table for Functional Responses of Deaf and Hearing Children

Source	Degrees of Freedom	Mean Sum of Squares	F
Achievement	2	1420.39	14.08**
Deaf/Hearing	1	6463.58	64.09**
Age	2	1128.59	11.19**
Achievement x Deaf/Hearing	2	1025.04	10.16**
Achievement x Age	4	20.06	.20
Deaf/Hearing x Age	2	1091.32	10.82**
Achievement x Deaf/Hearing x Age	4 4	95.51	.95
Within	521	100.84	
Total	538	126.42	

**Significant beyond the .01 level.

A table of means was prepared and comparisons performed using the Scheffé technique. The results of the Scheffé comparisons indicated that deaf low achievers used less functional responses than deaf average achievers (Mean of 47.67 compared with a Mean of 52.63). Deaf low achievers also used less functional responses than deaf high achievers (Mean of 47.67 compared with a Mean of 59.36). Deaf average and high achievers did not differ from one another in these means. No differences were observed in the functional means of hearing children at different achievement levels. The hypothesis that functional responding increases over achievement levels is confirmed only for the deaf sample.

Deaf children at 84-115 months of age used less functional responses than deaf children at either ages 116-147 months of age or 148-179 months of age (Mean of 47.78 compared with Means of 58.32 and 57.17), while deaf children of 116-147 and 148-179 months of age did not differ in these means.

The hypothesis that functional responding increases with age is confirmed for the deaf sample. Hearing children at these age levels did not differ from one another in functional responding (Mean of 84-115 months of age group was 62.39, Mean of 116-147 months of age group was 62.08 and Mean of 148-179 months of age group was 63.05).

The comparisons between deaf and hearing children of the same achievement level produced two significant findings. Deaf low achievers used less functional responses than hearing low achievers, and deaf average achievers used less functional responses than hearing average achievers; deaf and hearing high achievers did not differ from one another in these means.

The comparisons between deaf and hearing children at the same age levels also produced two significant comparisons. Deaf children of 84-115 months of age used less functionals than their hearing peers; deaf children of 148-179 months of age used less functionals than their hearing peers; while deaf and hearing children of 116-147 months of age did not differ from one another in these means. The hypothesis that deaf children use more functional responses than hearing children is not confirmed.

Associative

No significant F ratios emerged in the analysis of variance of the associative responses. The means of all the subgroups ranged from 38 to 43, indicating that chance responding was most likely in effect on this category. It was possible to obtain a score of 42 for any category by chance alone ($\frac{1}{2}$ of the items containing the category choice). Thus, it is unwise to report the results of the analysis of associative responses.

Deaf Samples

The analyses of variance performed solely on the categorization scores of children in the three schools for the deaf revealed no significant differences in superordinate, functional or associative responding among the different schools.

Matched Pairs

The results of the analyses of variance on deaf and hearing children's categorization scores where deaf and hearing children were matched exactly on reading achievement scores revealed no significant differences between children at any of the schools for the deaf and their hearing achievement peers.

Special Class Samples

When deaf children in special classes were matched with their reading achievement peers in regular classes, no significant differences were found in the categorization scores of these groups.

Correlational Analysis

The results of an initial 28x28 matrix showed significant correlations between modes of categorization and the variables of age and grade average for both total deaf and total hearing samples.

Superordinate responding decreased with age for the deaf group ($\underline{r}$ of -.22, significant beyond the .01 level), while superordinate responding increased with age for the hearing group ($\underline{r}$ of .14, significant beyond the .05 level). The hypothesis that superordinate responding increases with age is confirmed only for the hearing sample.

As age increased, functional responding increased for the deaf sample ($\underline{r}$ of .28, significant beyond the .01 level), while no significant correlation emerged between age and functional responding for the hearing sample ($\underline{r}$ of .00). The hypothesis that functional responding increases with age is confirmed only for the deaf sample. Associative responding decreased with age for both deaf and hearing samples ($\underline{r}$ of -.14, and -.16, significant beyond the .05 and .01 levels).

A similar pattern of correlation emerged between grade average and mode of categorization for the deaf sample. As grade average increased, superordinate responding decreased ($\underline{r}$ of -.22, significant beyond the .01 level), functional responding increased (r of .28, significant beyond the .01 level) and associative responding decreased (r of -.15, significant beyond the .05 level). As grade average increased in the hearing sample, no increase occurred in either superordinate or functional responding, but a significant decrease in associative responding was evidenced (r of -.12, significant beyond the .05 level).

The matrixes run separately for each school for the deaf resemble those of the overall correlation matrix for the deaf, with the exception of School for the Deaf 2. At this school no significant correlations emerged between age and mode of categorization, or grade average and mode of categorization. At Schools 1 and 3, increased age was accompanied by decreased superordinate responding, increased functional responding and decreased associative responding. As grade average increased, superordinate and associative responding decreased, while functional responding increased.

Few significant correlations emerged in the matrixes (other than those already described). The variable of sex correlated only with grade average for the hearing sample (males negatively, females positively). Socioeconomic status did not correlate significantly with any other variable for the deaf sample, but correlated significantly with grade average in the hearing sample (r of -.16, significant beyond the .01 level). These correlations are in the expected direction. Age and grade average were significantly correlated for both deaf and hearing samples (r's of .57 and .66, both significant beyond the .01 level). These correlations are also in the expected direction. Other significant correlations, such as dB loss and number of associative responses are meaningless and will not be reported here.

Test Reliability and Validity

Reliability

The split-half correlations between superordinate choices, parts 1 and 2 was .78 for the deaf group and .66 for the hearing group. The correlations between functional choices, parts 1 and 2 were .81 for the deaf group and .52 for the hearing group. The correlations between associative choices, parts 1 and 2 were .41 for the deaf group and .45 for the hearing group. All the correlations were significant beyond the .01 level. The correlations between part and total scores for each category ranged from .83 to .96, all correlations were significant beyond the .01 level.

Validity

The results of the item analysis resulted in correlations ranging from poor (.02) to excellent (.80). Sixty-five superordinate discriminating items remained out of 84, 58 out of 84 functionals and only 25 out of 84 associatives, calling for fairly extensive revision of the test, especially for the associative category.

DISCUSSION

Categorization Behavior of the Deaf

The purpose of this project was to establish the way in which the deaf child orders his world. It was presumed that his language retardation would not affect his performance on the Triple Mode Test of Categorization. Vygotsky's premise that categorization behavior is related to language development served as a rationale for correlating categorization behavior with the child's age and reading score. The results of this study offer a confusing picture of the deaf child's categorization behavior.

Age and Mode of Categorization

In Vygotsky's system the child is presumed to follow a developmental path in his categorization behavior. Early in his life, the child groups objects in his environment with no apparent principle in mind. It may just be that he sees certain objects continually placed together and forms a tenuous connection, as to their "belongingness." His toys "belong" in his playpen, the orange juice "belongs" with breakfast. In current psychological terms, this would be considered as a type of association; bonds between various objects or events are established on the basis of contiguity in time and space. In this investigation, this rather primitive type of categorization is also termed association.

If, indeed, this type of categorization is based on rather tenuous and unique connections between objects, it should drop out of the child's repertoire as he develops more sophisticated ways of grouping the objects in his environment. Precisely this result occurred in the sample under study, with increasing age, associative responses decreased. In the factorial analysis however, no differences occurred in the associative responses of children at different ages, though it had been hypothesized that this type of categorization would be preferred by young children. Perhaps the youngest child in this study (84 months of age) was too old to prefer this type of categorization. It is also probable that the associative category is not discriminating enough. The validation of this category was extremely difficult and an additional validation was needed. Each stimulus was placed at the top of the page, and fourteen psychologists asked to write five associations for each stimulus. Every fifth response was noted and a new background drawn under the criterion of remote association, still, the poor internal consistency coefficients for this category indicate that a thorough reevaluation of this category is necessary, both from a theoretical and a measurement viewpoint.

As the child leaves the associative phase in grouping, he forms collections of objects which "belong" by virtue of some functional relationship. The results of the present study confirm this higher categorization principle. Deaf children do show increases in functional responding with increasing age. This increase occurs from 84-115 months of age to 148-179 months of age, though the children of 116-147 months of age and 148-179 months of age were not different from one another. This category is both reliable and valid.

The epitome of categorization behavior in Vygotsky's system occurs with mastery of the superordinate. This type of categorization behavior permits a child to operate with a minimum number of concepts at any given time. To Bruner, it reduces the strain of information impinging upon the child and to Piaget and Inhelder (9,5) it permits the child to engage in formal reasoning. This type of categorization appears to be foreign to the deaf child. Where an increase in superordinate responding should occur with increasing age, it does not. In fact, the deaf child decreases in superordinate responding with increasing age. A possible factor operating here is the deaf child's environment. Most deaf children are molded not so much by societal environs as they are shaped by their school curricula. It is fairly standard practice in most schools for the deaf to structure the nursery in a superordinate fashion. That is, there are neat little boxes and experience charts in the nurseries, kindergartens and lower school classrooms which provide class labels for the child. There's a box marked TOYS, a chart marked CLOTHING and a flannel board labelled ANIMALS. Few people check on the child's understanding of these labels. As the child progresses through the system, no such handy labels are provided for him, he is supposed to deduce the superordinate himself. Perhaps he needs a little extra help to do this. Or, perhaps, we have to investigate what it is that helps a child to form a superordinate set.

Reading Achievement and Mode of Categorization

As the child matures, he is supposed to demonstrate corresponding improvement in his school achievement. Since there are always significant correlations between age and grade average, similar developmental levels of categorization behavior should be evidenced by children of different achievement levels. For the deaf child, increases in grade average and categorization behavior follow the same pattern as age levels. The higher the reading achievement, the less associatives he gives, the more functionals and fewer superordinates. As before, the rise in functional responding occurs from the low to the high group, with the average and high groups being similar.

The measurement of achievement in deaf children presents several problems. Typically the school system tests its children with a battery of standardized achievement tests, standardized, that is, on hearing children. The formulas for computing grade average are designed on the one-year-older, and one-year-higher-in-grade-average principle. This principle is completely incompatible with the results on rates of academic improvement in deaf children. Only the rarest deaf child advances one year of grade average for every chronological year. As more advanced batteries are used, the discrepancy widens, and in comparison to his hearing peer, the average deaf child is at least three to four years retarded in academic achievement by the time he reaches adolescence (2).

In this study, using the Stanford Achievement Reading Test, the average achievement level of the deaf child centered between the second and third grade. In fact, the range of scores on the achievement battery, looked more like the standard error of measurement of the test. The fact that any significant correlations could occur between grade average and any other variable is quite strange in view of this finding. Thus, there is considerable question as to the validity of testing the deaf child with such an achievement instrument. For the moment the question of differential exposure to language in deaf and hearing children has been cast aside, though this is by no means a small issue. In fact, the results of this study could easily be turned around to point to the deaf child's inferiority in conceptual tasks, even when verbalism is minimized (as it was in the categorization test). Lacking the verbal mediator (a class name), the deaf child fails to grasp the nature of the superordinate. This interpretation is not advanced in this study; the lack of superordinate responding in the older deaf child is viewed as a function of his eudcational environment.

It also does not appear to make much difference as to the particular school a deaf child attends. Children at all three schools, despite differences in achievement levels, responded similarly on the categorization test. The patterns of correlation between age, grade average, and modes of categorization was markedly different for only one of the schools for the deaf. One explanation is that the school may mold its children somewhat differently than the other two schools.

Similarly, class placement does not seem to be a factor.in categorization behavior. Both typically deaf and special class deaf children responded similarly on the categorization test when they were matched exactly on reading achievement scores.

Categorization Behavior of the Hearing

Quite different results were obtained for hearing children.

Age and Mode of Categorization

With increasing chronological age, the hearing child offers more superordinate and less associative responses. The results of the analyses of variance did not, however, support this conclusion, as none of the age means proved to be different in the Scheffé comparisons. A similar result was found for the hearing child's functional responses. The interpretation offered is that the hearing child has already developed consistent means of ordering the environment.

Reading Achievement and Mode of Categorization

A similar developmental pattern emerged for the relation of grade average and mode of categorization. There is, however, no increase in superordinate responding with increasing grade average. The objection to standardized achievement testing cannot be proferred here as it was for deaf children. One possible explanation is that the achievement trichotomy was artificial. Even though the grade averages were transformed into standard scores, the assignment to only three levels of achievement does not permit much variation. An alternative interpretation is that Vygotsky's model cannot adequately be tested in this fashion. It is a developmental model, and as such the relation of age to categorization modes is much more significant than the relation of achievement to categorization behavior.

It may have been more appropriate to determine differences in categorization behavior at different intelligence levels, however this would have necessitated the administration of an intelligence test that would have equal validity for deaf and hearing children; no such test exists.

Comparison of Categorization Behavior of Deaf and Hearing Children

Reading Achievement
Age and Mode of Categorization

Deaf children of 84-115 months of age and 148-179 months of age gave more superordinate responses than their hearing peers, while deaf and hearing children of 116-147 months of age did not differ. At this age, there is a decided dip in the superordinate responding of deaf children, though why this should occur is not clear.

Deaf and hearing children differed at the low and average achievement levels in superordinate responding, while the deaf and hearing high achievers did not differ from one another. It is quite possible that the high achieving deaf child is more like a hearing child of similar achievement level than his less well achieving counterparts.

The deaf child's growth in functional responding parallels the hearing child's growth in superordinate responding. Again, deaf and hearing children in the middle age group (116-147 months of age) responded quite similarly. Perhaps, in the absence of a superordinate strategy, the deaf child assumes a functional orientation to his environment.

The high achieving deaf child also resembles the high achieving hearing child in functional responding. In fact, the matched pairs analysis revealed that when deaf children are matched exactly with hearing children on reading achievement scores, all differences in categorization behavior disappear between these two groups. This is perhaps one of the most significant findings of the study, which is in accord with the work of Kates and his colleagues (6,7,8).

Triple Mode Test of Categorization

The Triple Mode Test of Categorization is a reliable instrument. It's internal consistency is good for the superordinate and functional items, but quite poor for the associative items. It needs a great deal of revision before it could be used to assess categorization behavior as postulated by Vygotsky. The scores for the categorization modes would have to be assigned differential point values (i.e., superordinate = 2, functional = 1, associative = 0). No such differential scoring was used in the present study and each mode was analyzed separately, as if the instrument were really composed of three separate tests. The severest procedural criticism of the study is that comparisons could not be made across modes of categorization. Statistically, this was precluded by the fact that the modes represented repeated measurement and no statistical comparisons were possible under this situation. Originally, statements of this comparative nature were planned, however this was not feasible in the execution of the analysis of the data. With a better instrument, the suggestive findings reported here could be used as a better validation of Vygotsky's system.

CONCLUSIONS AND IMPLICATIONS

The findings of the present investigation suggest that Vygotsky's system is a valid one for describing categorization behavior in children. The developmental guidelines hold up well in the analyses of both deaf and hearing children's categorization responses. For hearing children, superordinate responding rises with age, while associative responding decreases. Both of these results could be predicted from Vygotsky's theory. For deaf children, functional responding rises with age, while associative responding decreases; these results could be predicted from Vygotsky's model. The results which are antithetical to Vygotsky's position are the decline in superordinate responding with age in deaf children and the constancy of functional responding with age in hearing children.

The decline of superordinate responding in deaf children was interpreted as a function of the child's school environment, and it might be well to look into the curriculum for the roots of this decline. The constancy of functional responding in hearing children was interpreted on the basis of his stable categorization behavior.

The relation of grade average or categorization behavior follows fairly well the patterns of age and categorization behavior, though the use of an achievement instrument standardized on hearing children has little validity in the measurement of achievement in deaf children.

One suggestion for future research is the revision of the Triple Mode Test of Categorization, especially major changes in the construction of associative items. Another suggestion is the establishment of an achievement test designed for and standardized on deaf populations.

It is also felt that this study may have started on too high a level, by investigating the modes of categorization which are already possessed by the deaf child. Since it is also felt that his categorization behavior is determined by his school environment a fruitful area of research would be to study the emerging patterns of categorization in the very young deaf child. This would involve a set theory approach to the problem; how does a child first begin to establish a set and what kinds of sets does he form? Further study would again involve setting up developmental guidelines, involving the child's use of rules, how many, and what kinds he uses to establish sets. The theoreticians whose work would be most relevant for this type of study would be Piaget and Inhelder, rather than Vygotsky, as they have done extensive work with young children on the development of classification behavior.

SUMMARY

The Triple Mode Test of Categorization was constructed and validated to measure three major roles of categorization as postulated by Vygotsky. This instrument along with the Stanford Achievement Reading Test was administered to 313 hearing children, 225 typically deaf children and 27 deaf children in special classes, to determine whether the deaf exhibit similar modes of categorization at the same or different developmental levels as hearing children. The modes of categorization were studied at different scholastic achievement levels of both deaf and hearing children to determine whether modes of categorization contribute to differential scholastic achievement.

The categorization scores of deaf and hearing children were analyzed by factorial analyses of variance and through correlational analyses.

Different developmental patterns were observed in the categorization modes of deaf and hearing children. With increasing age, superordinate and associative responding decreased, while functional responding increased in deaf children. With increases in grade average, similar results were obtained. For hearing children, increasing age was accompanied by increased superordinate responding, decreased associative responding and relatively stable functional responding. This same pattern emerged for grade average and modes of categorization. When deaf and hearing children were matched exactly on reading achievement scores, all differences in categorization behavior disappeared between these groups. Similarly, when special class deaf children were matched with their reqding achievement counterparts in the regular classroom, no differences were observed in the categorization behavior of these groups.

Vygotsky's model was partially confirmed by the results. The lack of superordinate responding in the older deaf child was interpreted as a function of the school environment, and is suggestive of the deaf child's difficulty in learning at least one aspect of language, superordinacy.

It was suggested that set operations in deaf children would be an appropriate area for future research, to explain the lack of superordinate sets in older deaf children.

REFERENCES

1. Bruner, Jerome S., Goodnow, Jacqueline J., and Austin, George A. A Study of Thinking. New York: John Wiley & Sons. 1957. 302 p.

2. Furth, Hans G. "A Comparison of Reading Test Norms of Deaf and Hearing Children," American Annals of the Deaf. III, 1966. p. 461-462.

3. Furth, Hans G. "Research with the Deaf: Implications for Language and Cognition," Psychological Bulletin. LXII, 1964, p. 145-164.

4. Hamburger, Martin. A Revised Occupational Scale for Rating Socioeconomic Class. Mimeographed paper, Teachers College, Columbia University. May 1957. 7 p.

5. Ihhelder, Bärbel. "Some Aspects of Piaget's Genetic Approach to Cognition," in "Thought in the Young Child: Report of a Conference on Intellective Development with Particular Attention to the Work of Jean Piaget," Monographs of the Society for Research in Child Development. XXVII, 1962, Serial No. 83. p. 19-34.

6. Kates, S. L., Kates, W. W., and Michael, J. "Cognitive Processes in Deaf and Hearing Adolescents and Adults," Psychological Monographs. LXXVI, 1962. Whole No. 551.

7. Kates, S. L., Kates, W. W., Michael, J., and Walsh, T. M. "Categorization and Related Verbalizations in Deaf and Hearing Adolescents," Journal of Educational Psychology. LII, 1961. p. 188-194.

8. Kates, S. L., Yudin, L., and Tiffany, R. K. "Concept Attainment by Deaf and Hearing Adolescents," Journal of Educational Psychology, 53, LIII, 1962. p. 119-126.

9. Piaget, Jean. "Principal Factors Determining Intellectual Evolution from Childhood to Adult Life," in Hartley, E. L., Birch, H. G. and Hartley, R. E. (Editors), Outside Readings in Psychology. New York: Crowell Company. 1950. p. 80-90.

10. Rosenstein, Joseph. "Perception, Cognition and Language in Deaf Children," Exceptional Children. XXVII, 1961. p. 276-284.

11. Scheffé, Henry. The Analysis of Variance. New York: John Wiley & Sons. 1959. 477 p.

12. Thorndike, Robert L. Personnel Selection: Test and Measurement Techniques. New York: John Wiley & Sons. 1962. Table 3: A Table of the Values of the Product-Moment Coefficient of Correlation in a Normal Bivariate Population Corresponding to Given Proportions of Success. p. 348-351.

13. Vygotsky, Lev S. Thought and Language. MIT Press and New York: John Wiley & Sons. 1962. 168 p.

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Different developmental patterns were observed in the categorization modes of deaf and hearing children. With increasing age, superordinate and associative responding decreased, while functional responding increased in deaf children. With increases in grade average, similar results were obtained. For hearing children, increasing age was accompanied by increased superordinate responding, decreased associative responding and stable functional responding. This same pattern emerged for grade average and modes of categorization. When deaf and hearing children were matched exactly on reading achievement scores, all differences in categorization behavior disappeared between these groups, Similarly, when special class deaf children were matched with their reading achievement counterparts in the regular classrooms, no differences were observed in the categorization behavior of these groups. Vygotsky's model was partially confirmed by the results. The results also suggest that deficiencies in categorization behavior may contribute to deficient language performance in the deaf child.

16. RETRIEVAL TERMS:

categorization behavior
achievement
deaf

17. IDENTIFIERS:

TMT CAT (Triple Mode Test of Categorization)

TMT CAT

TRIPLE MODE TEST OF CATEGORIZATION

BY TOBY SILVERMAN

NAME:

SCHOOL:

CLASS:

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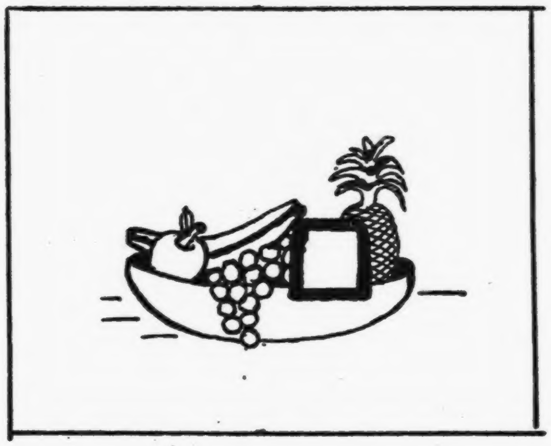

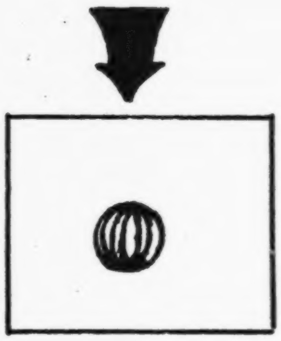

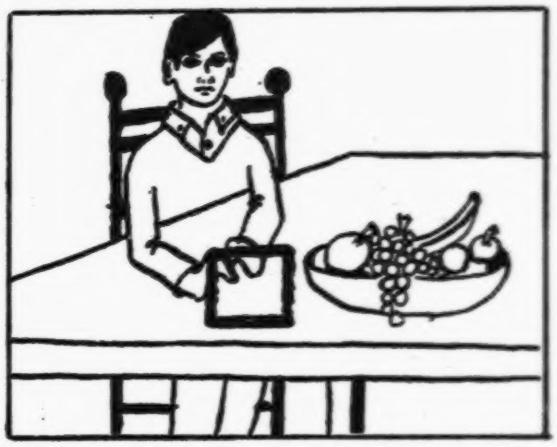

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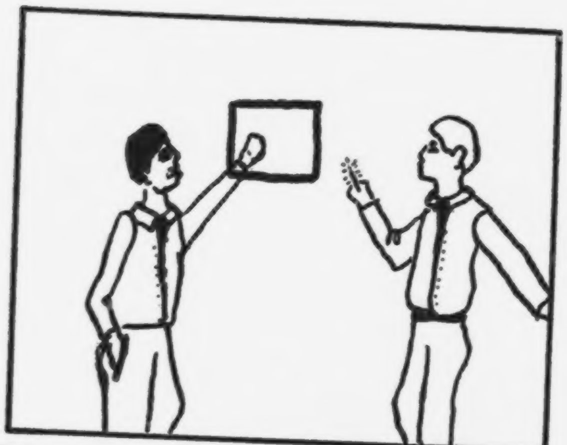
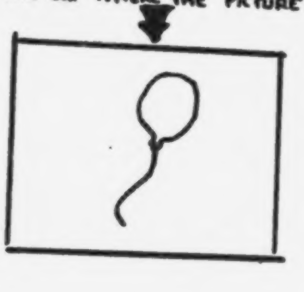
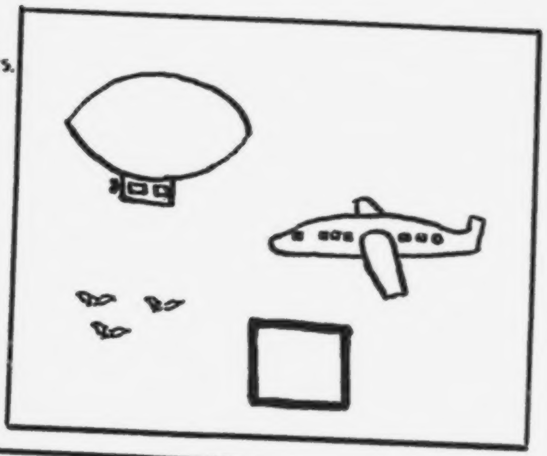
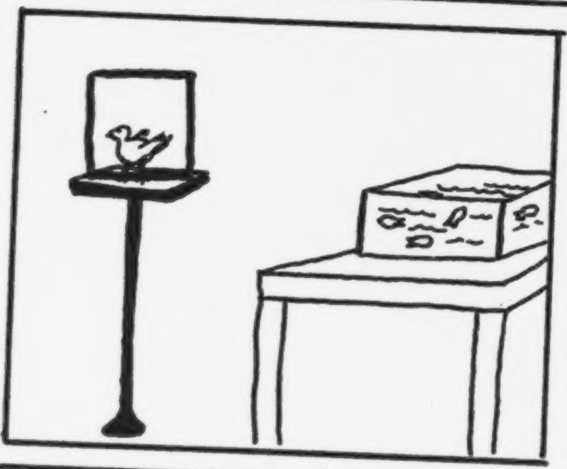
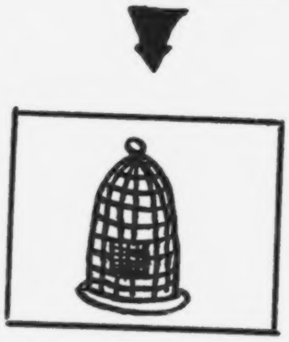
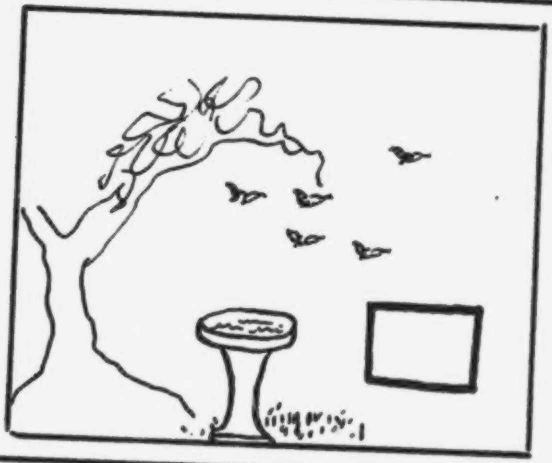
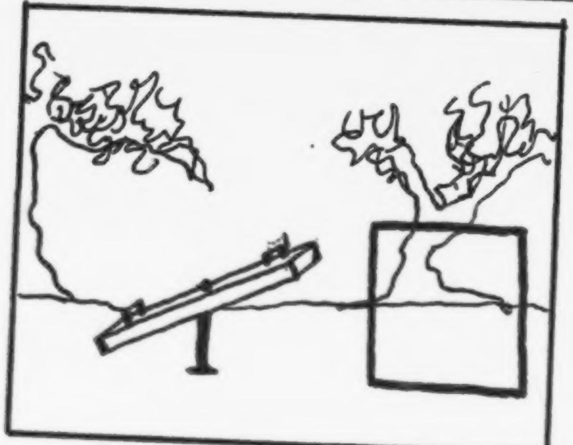
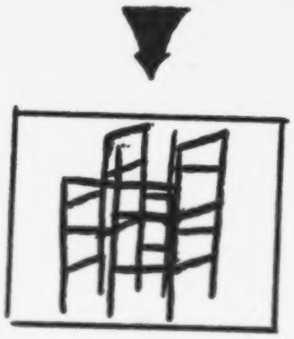
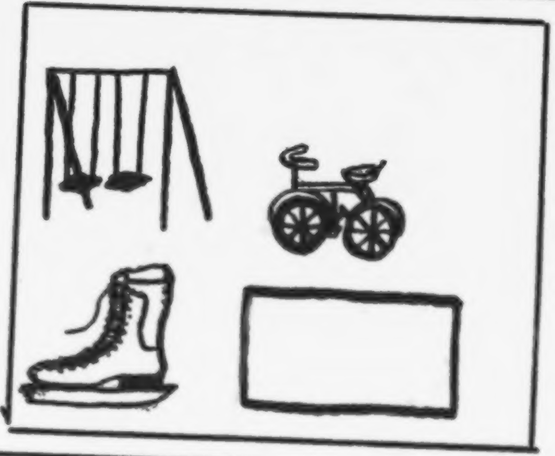
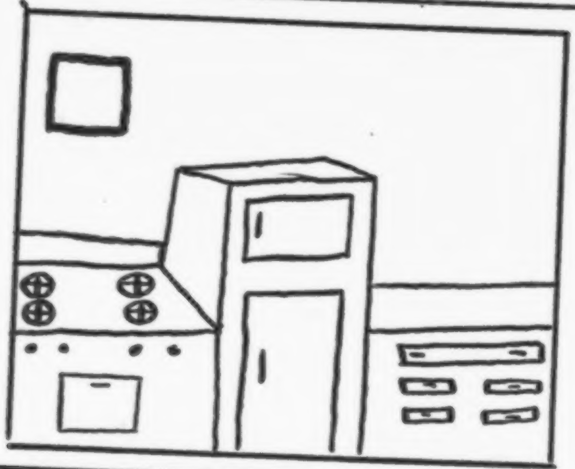
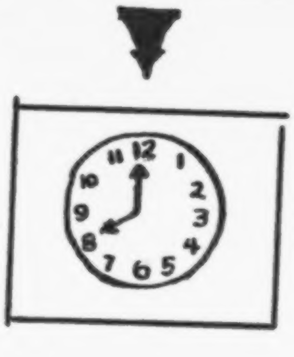
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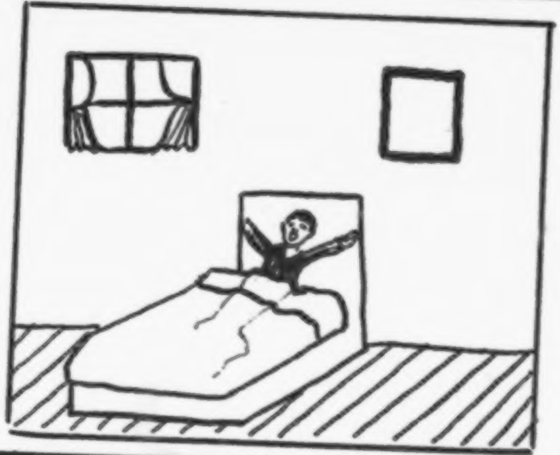

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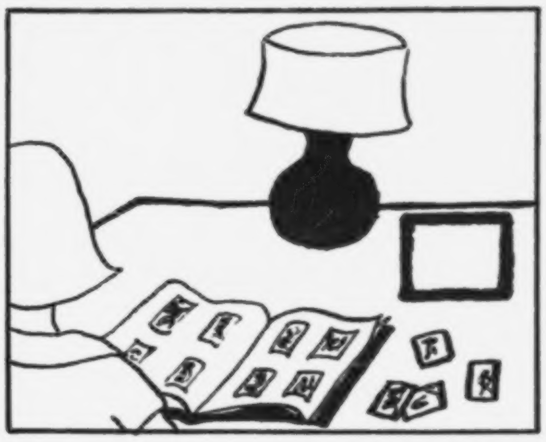

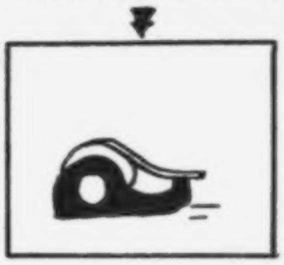

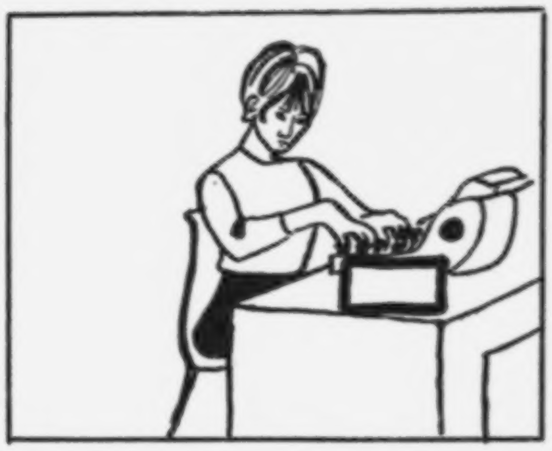

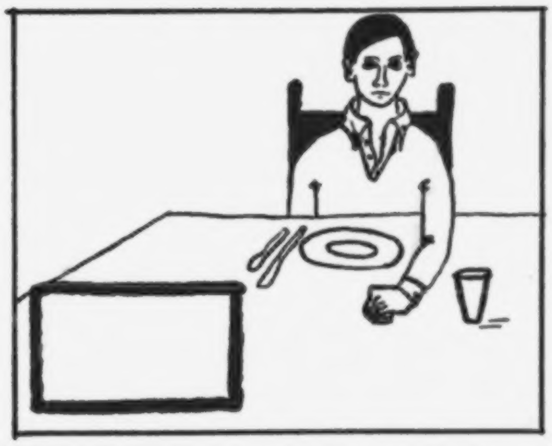

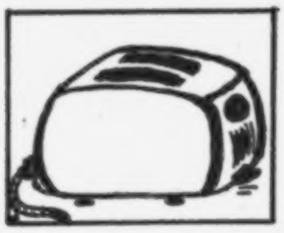

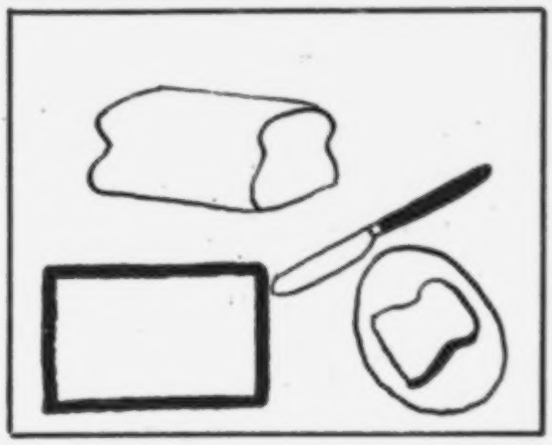

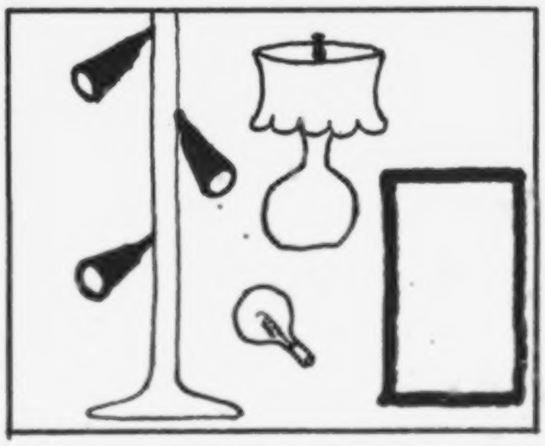

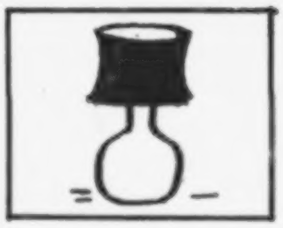

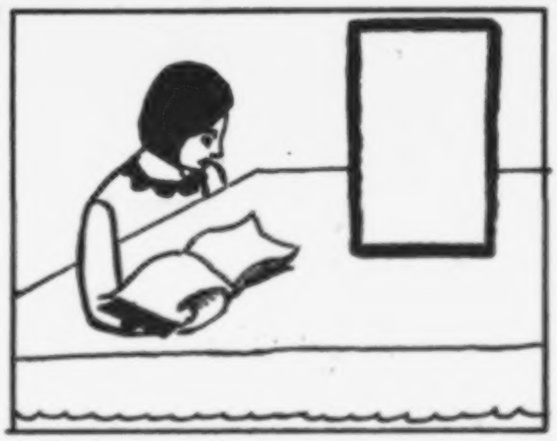

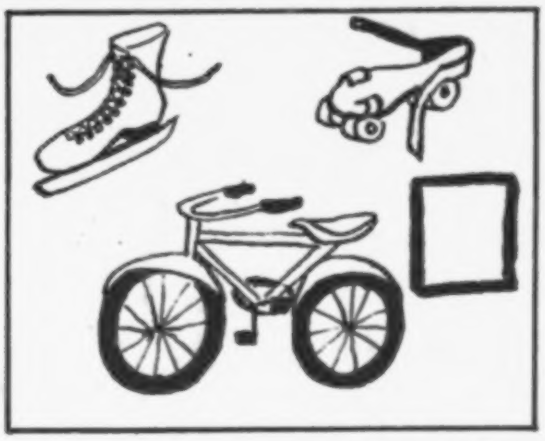

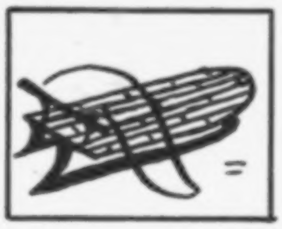

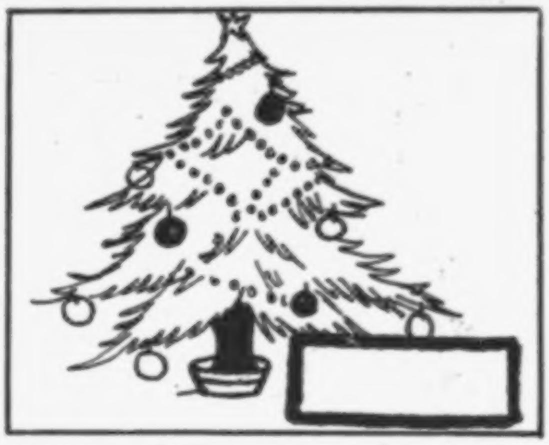

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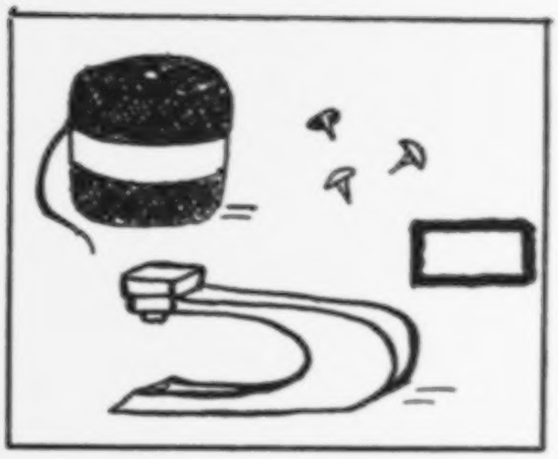

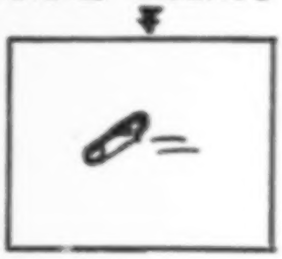

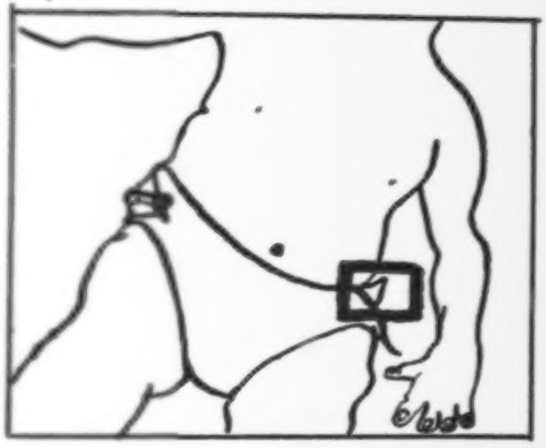

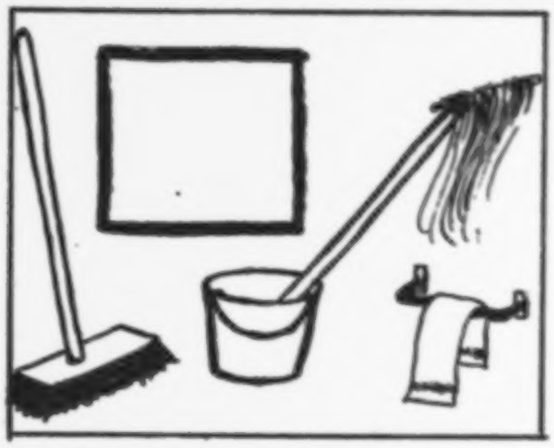

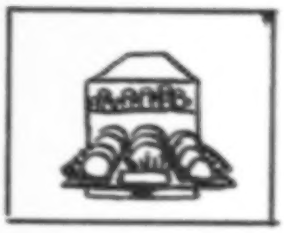

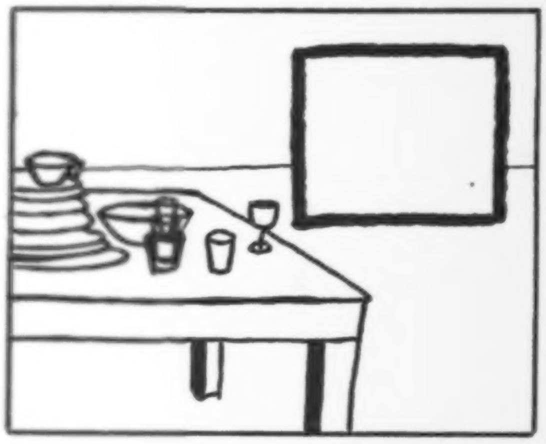

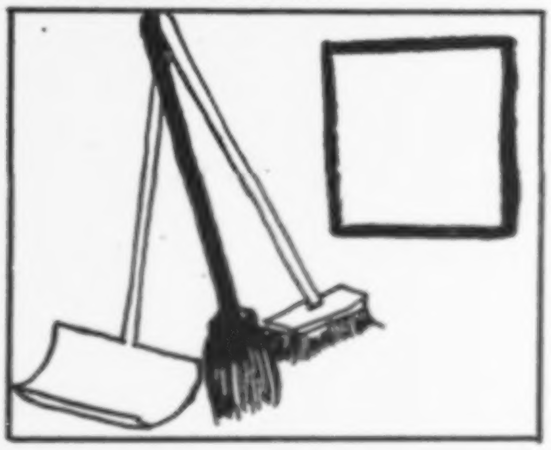

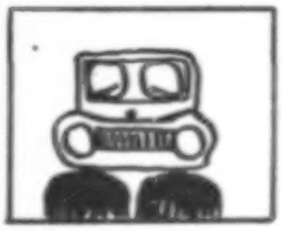

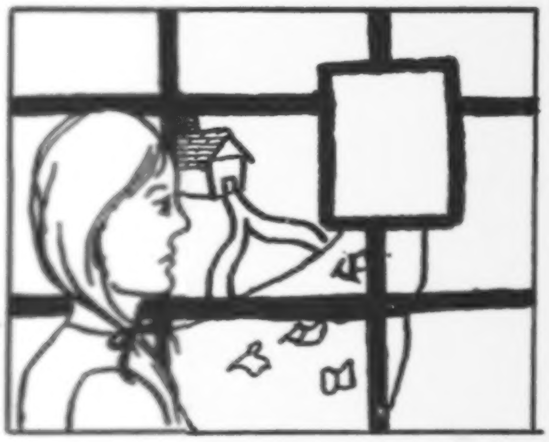

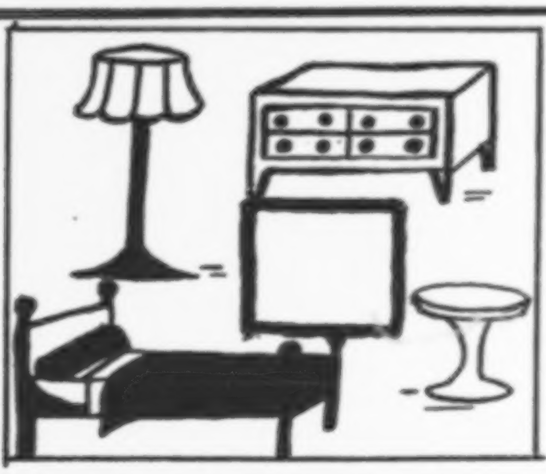

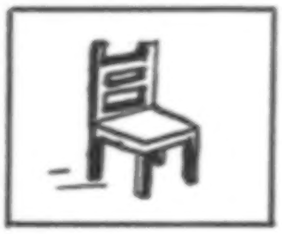

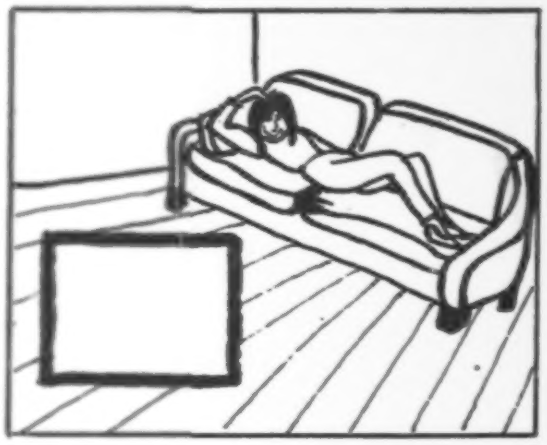

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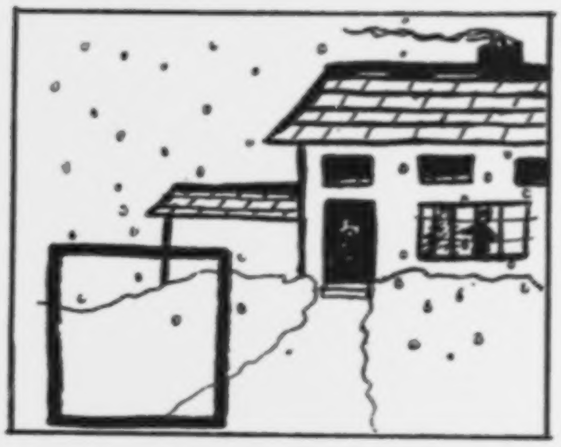

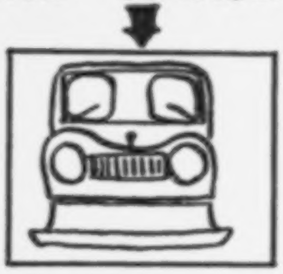

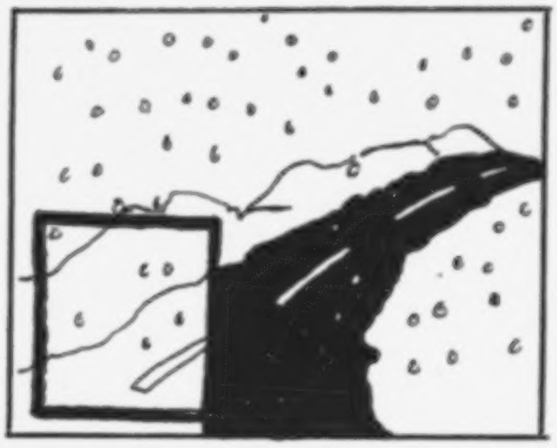

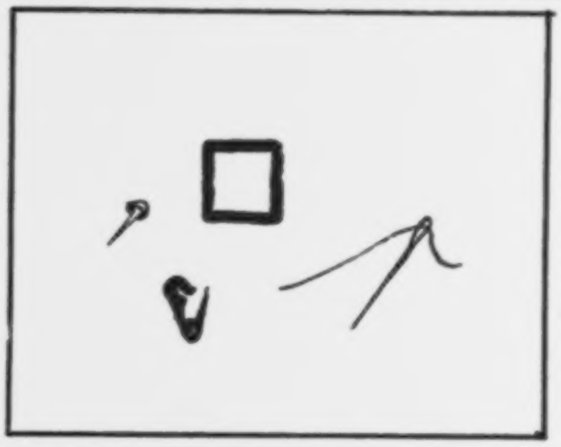

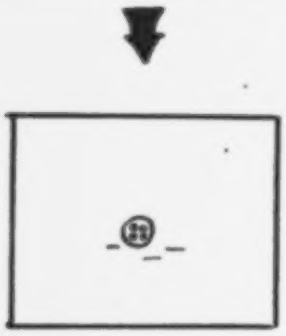

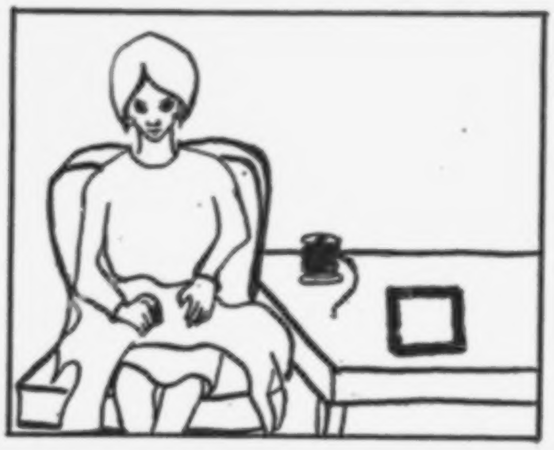

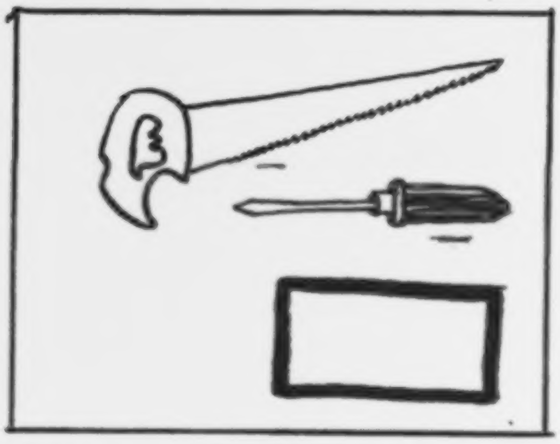

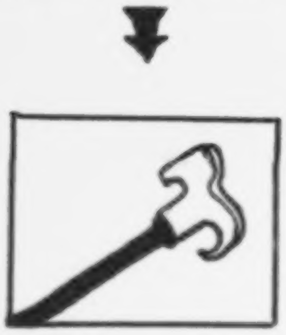

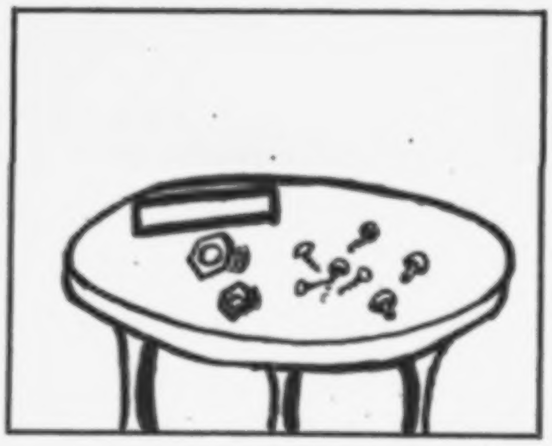

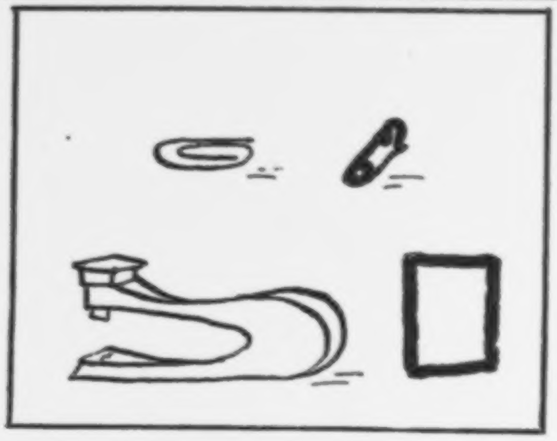

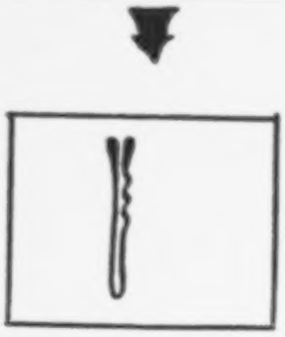

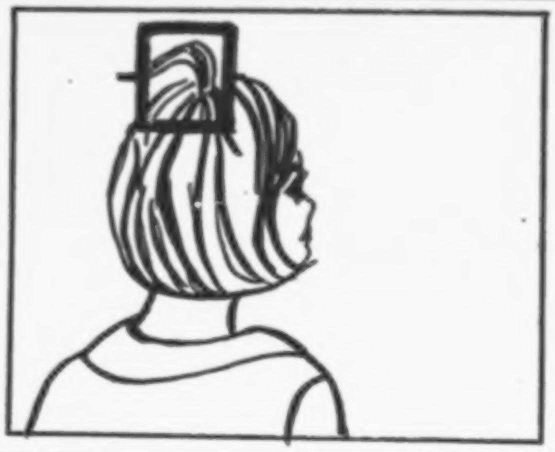

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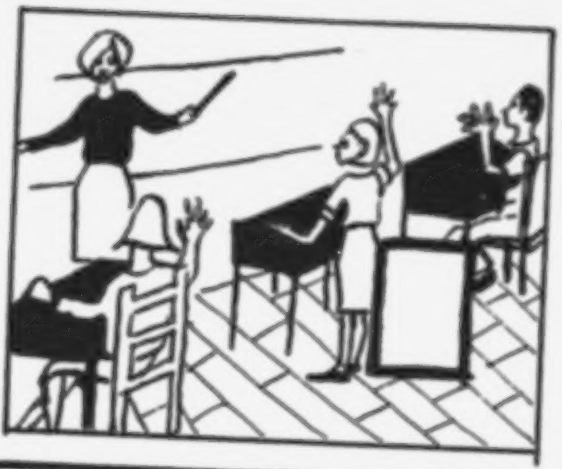

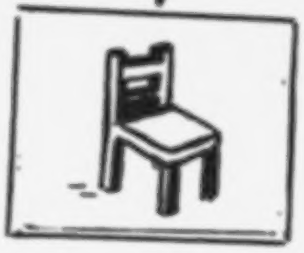

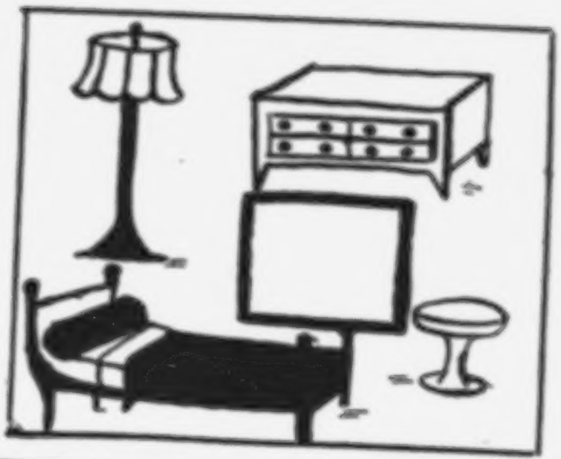

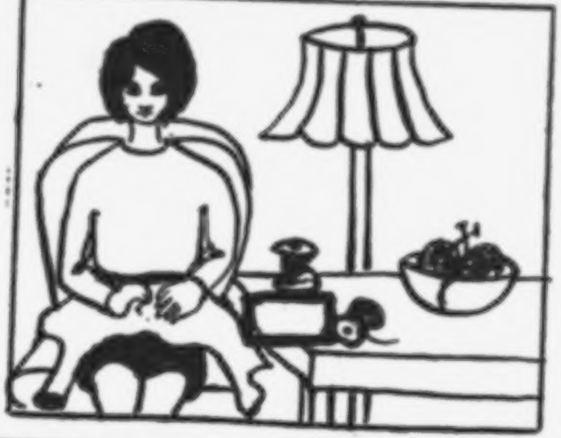

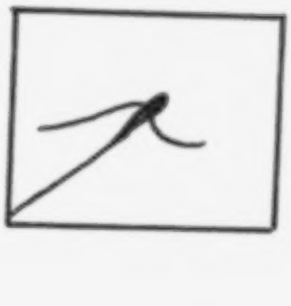

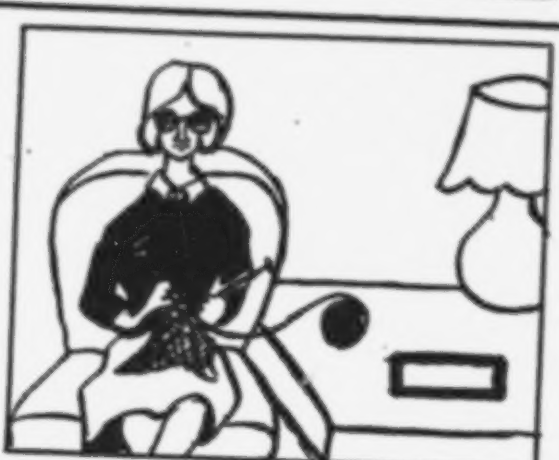

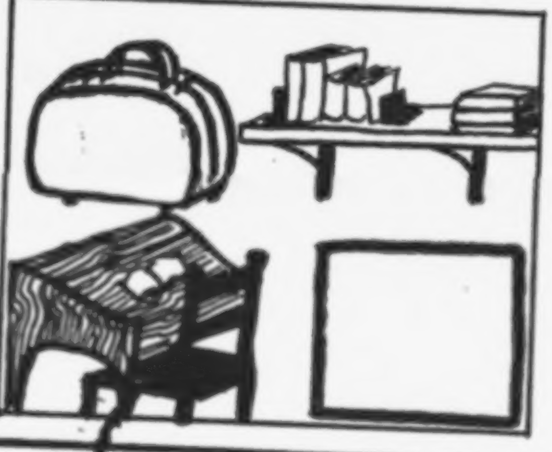

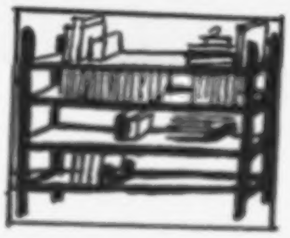

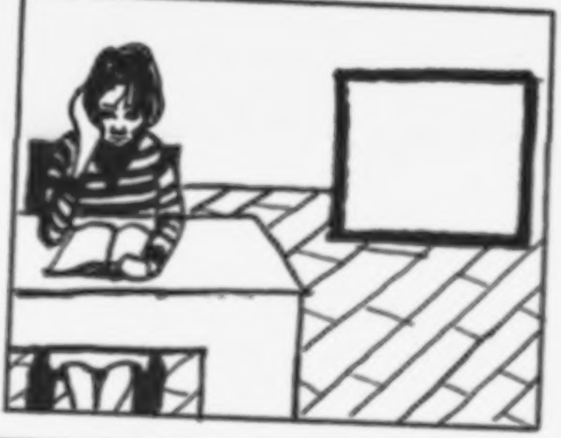

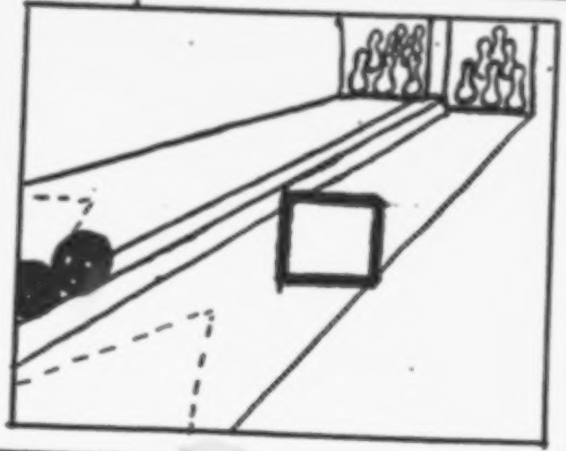

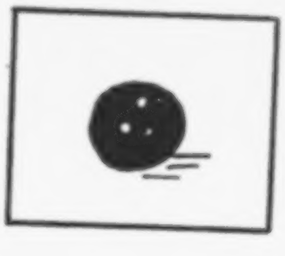

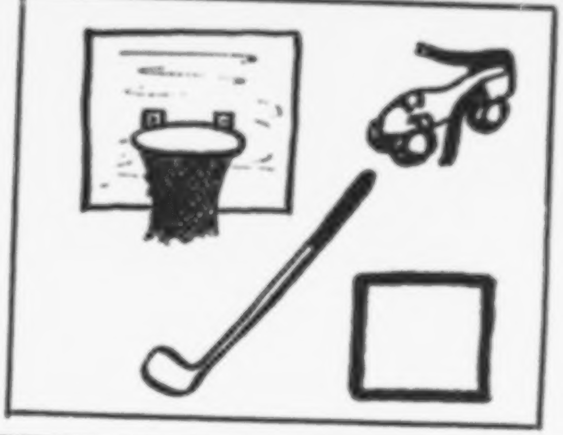

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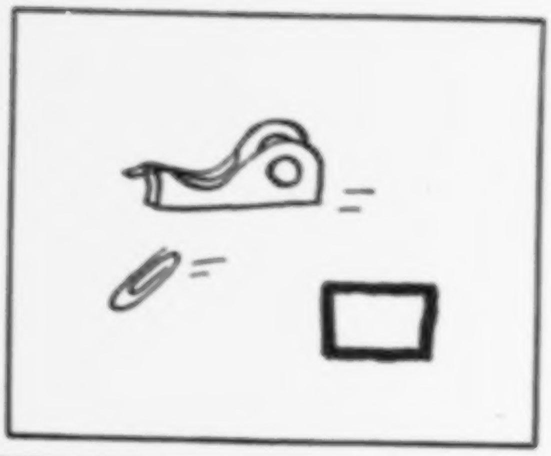
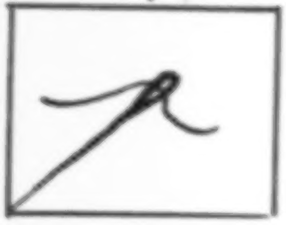
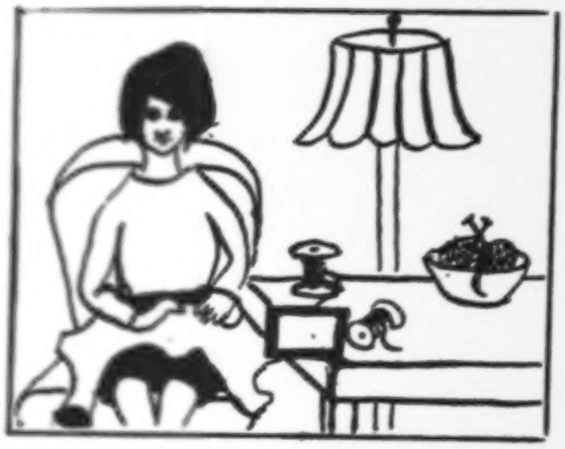
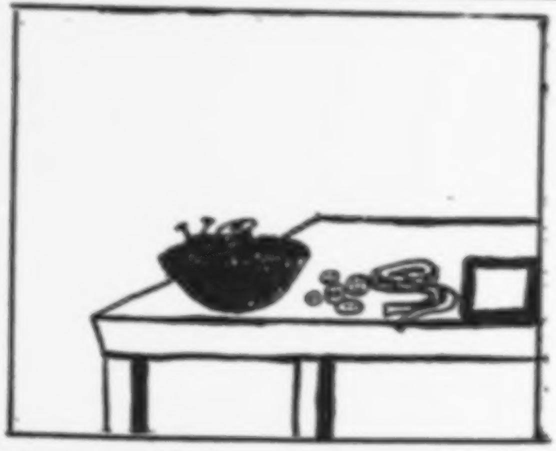
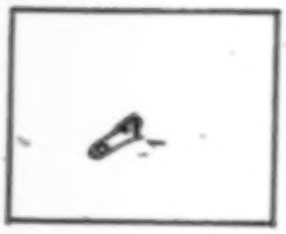
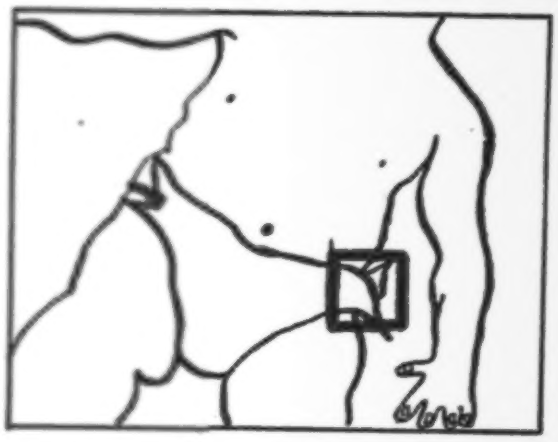
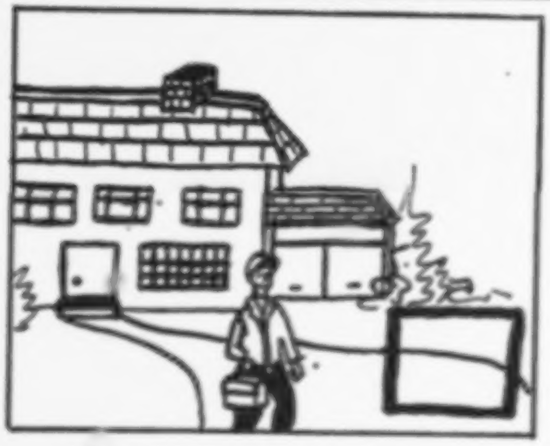
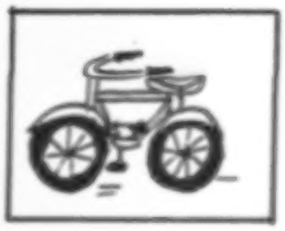
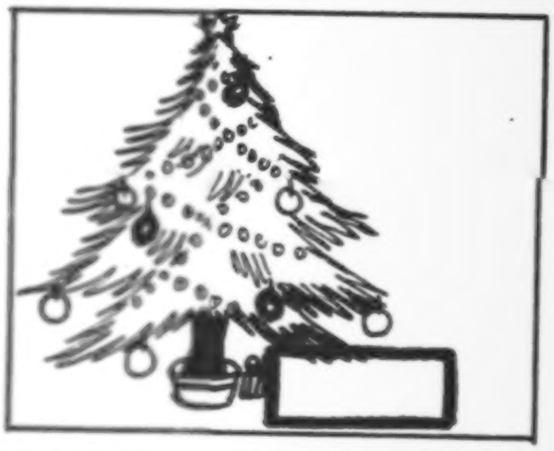
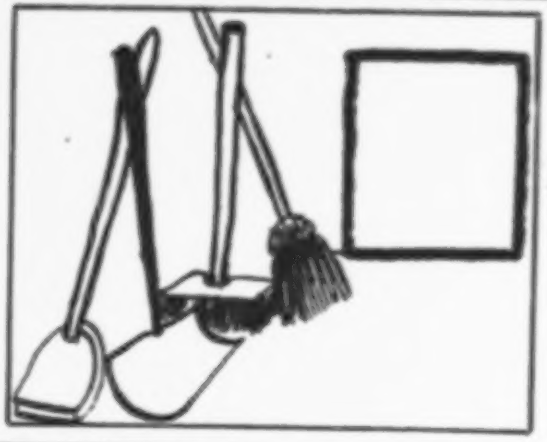
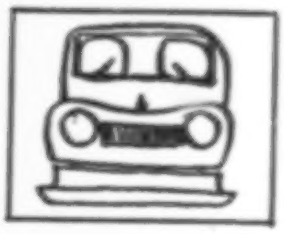
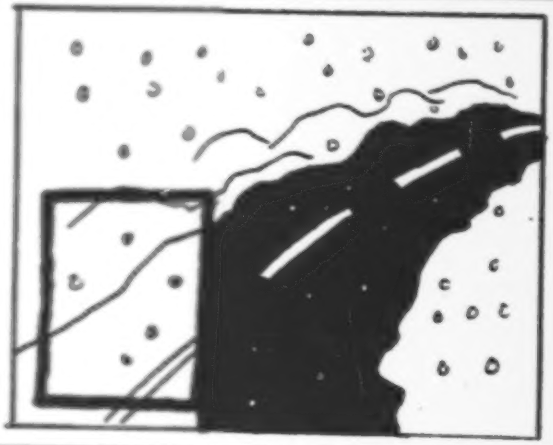

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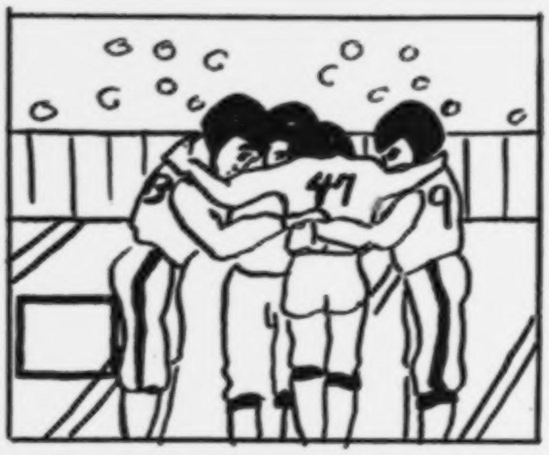

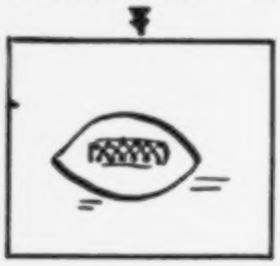

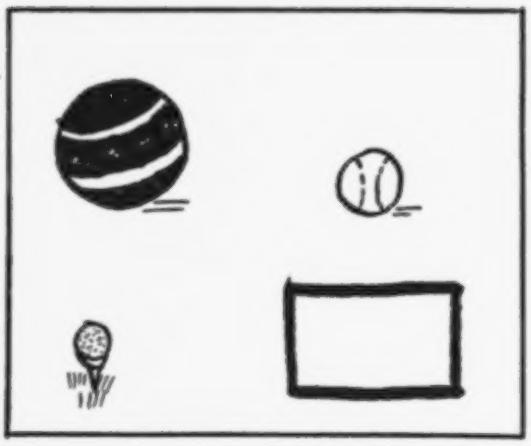

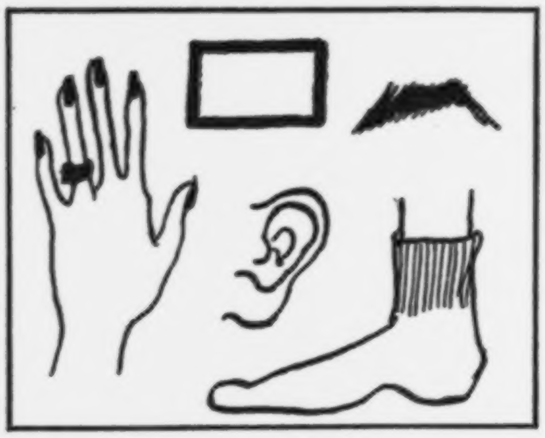

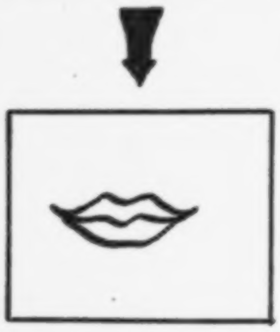

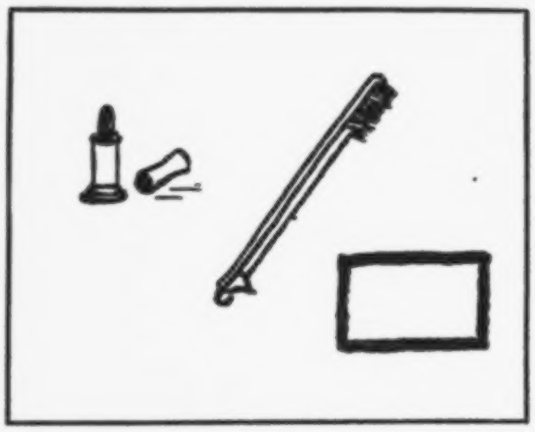

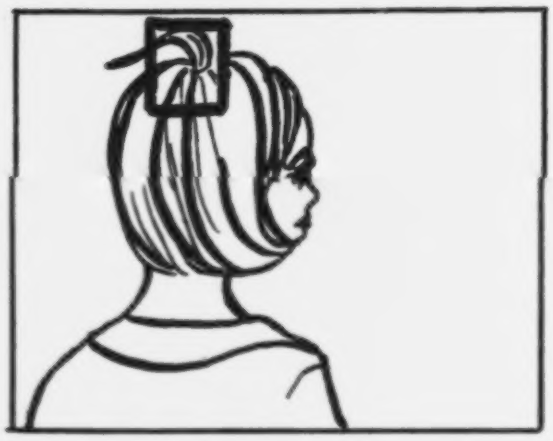

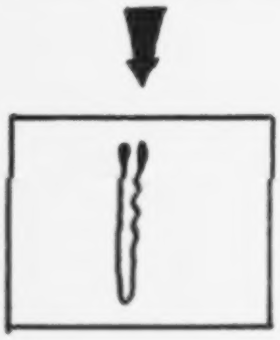

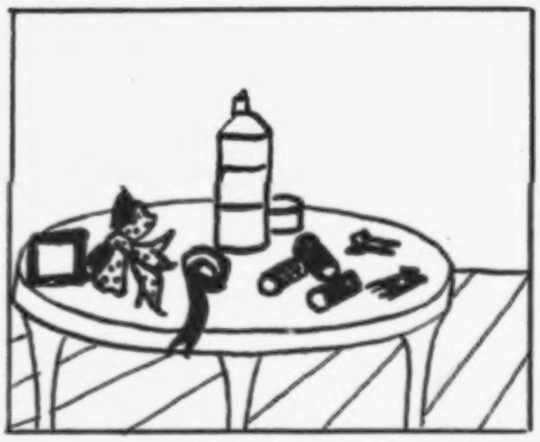

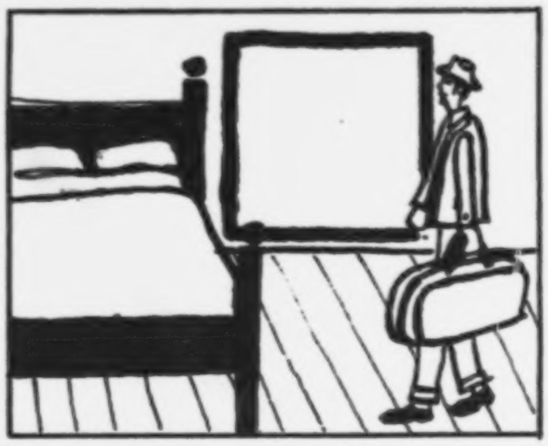

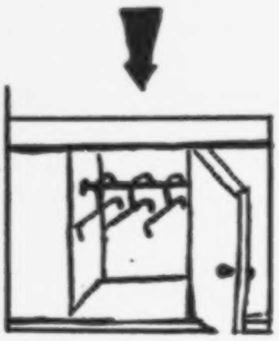

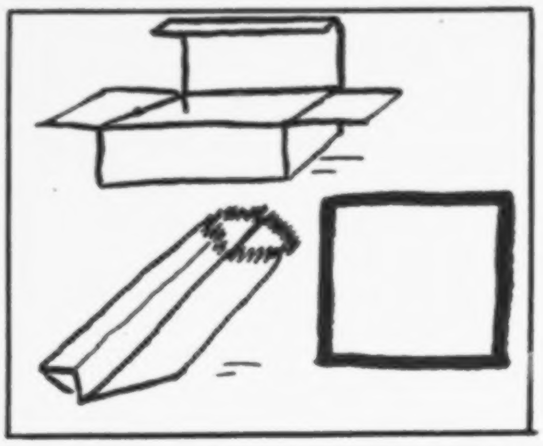

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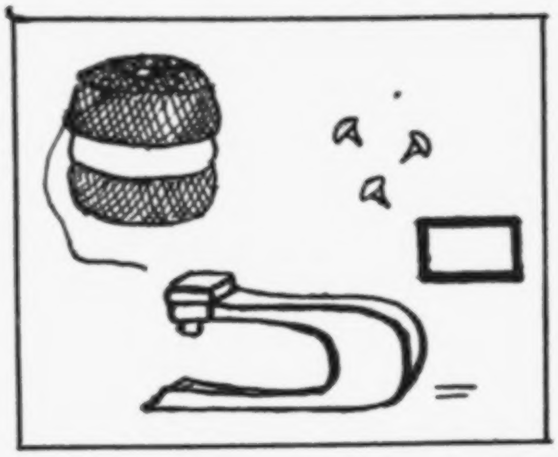

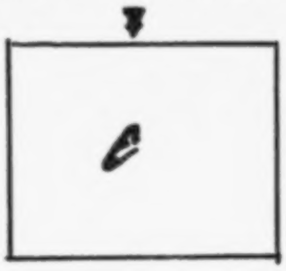

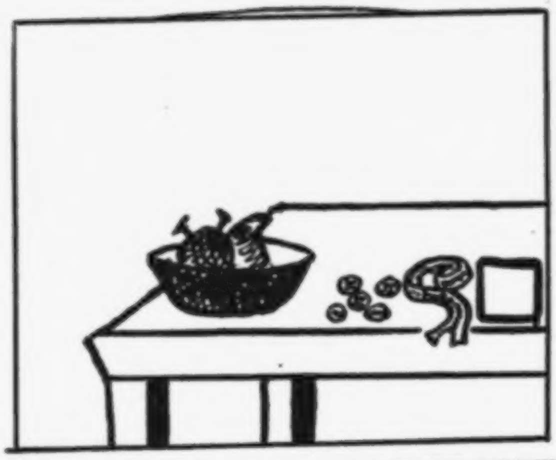

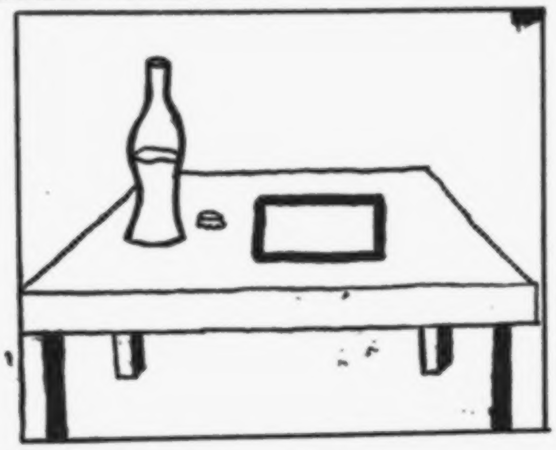

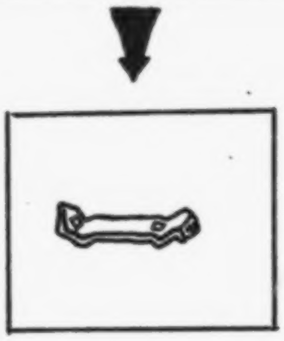

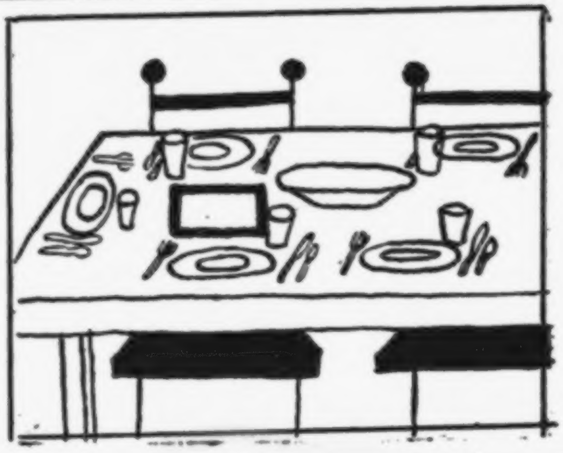

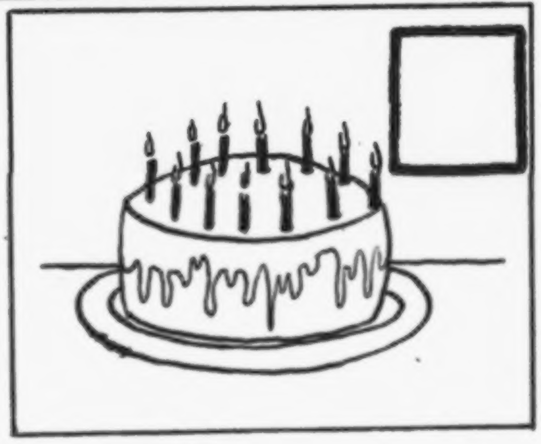

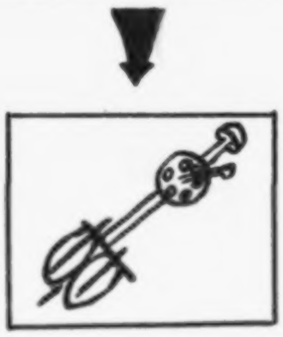

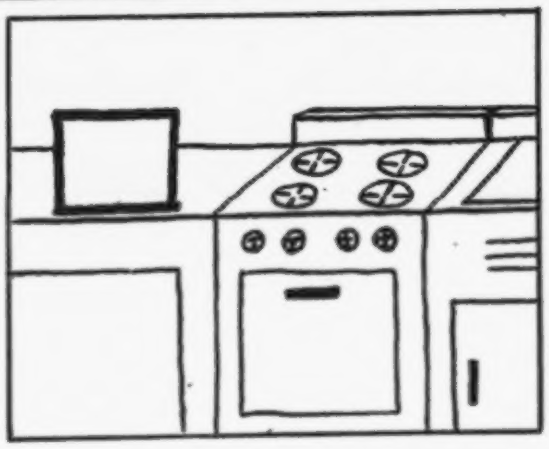

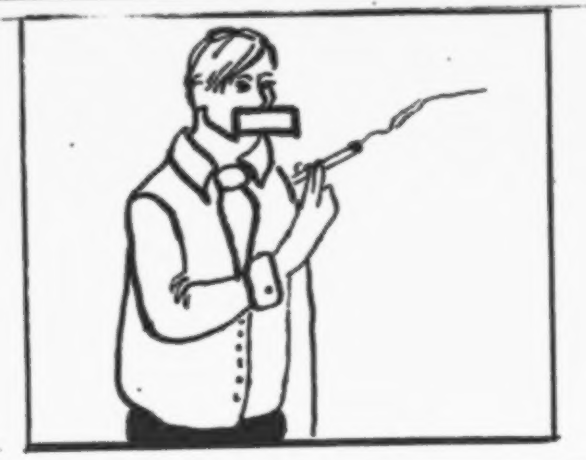

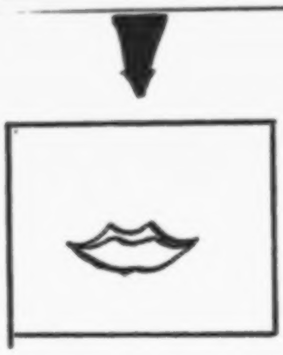

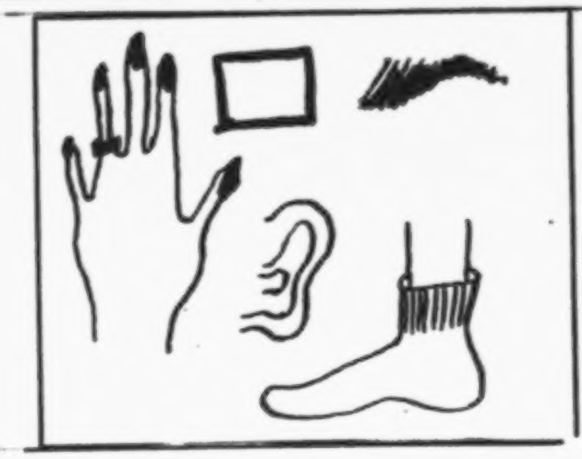

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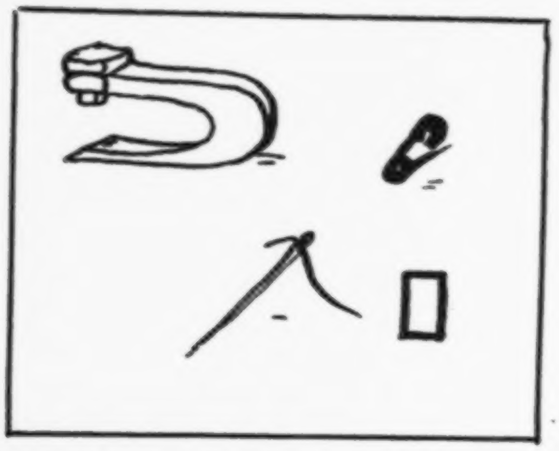

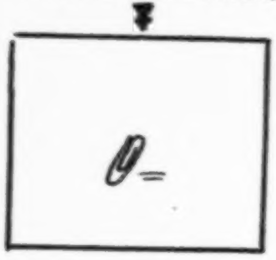

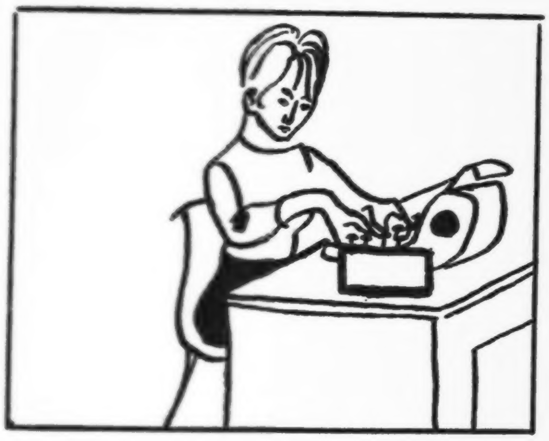

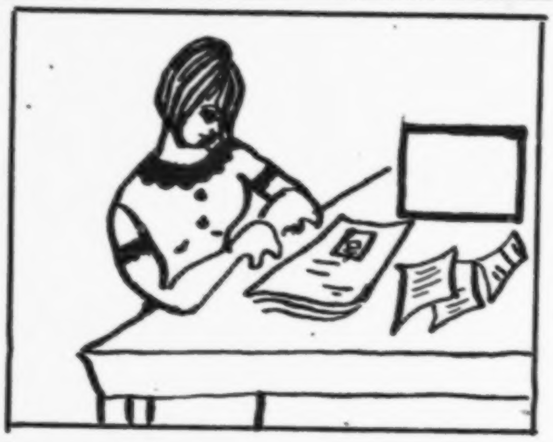

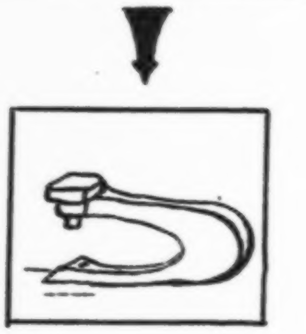

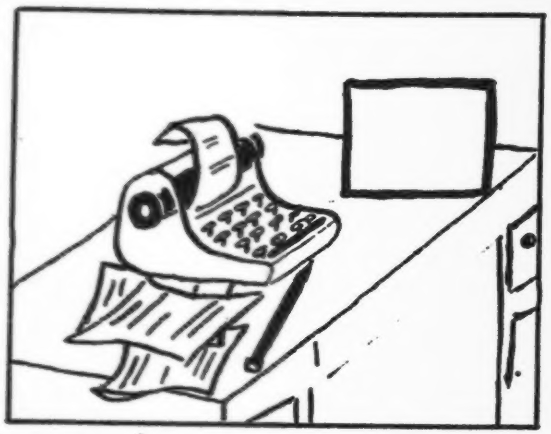

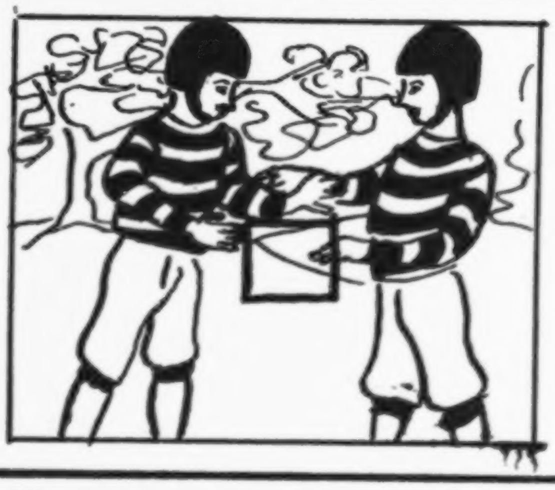

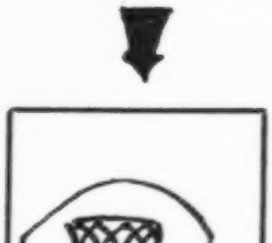

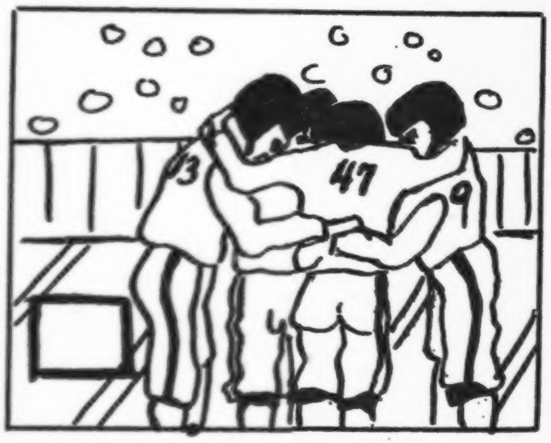

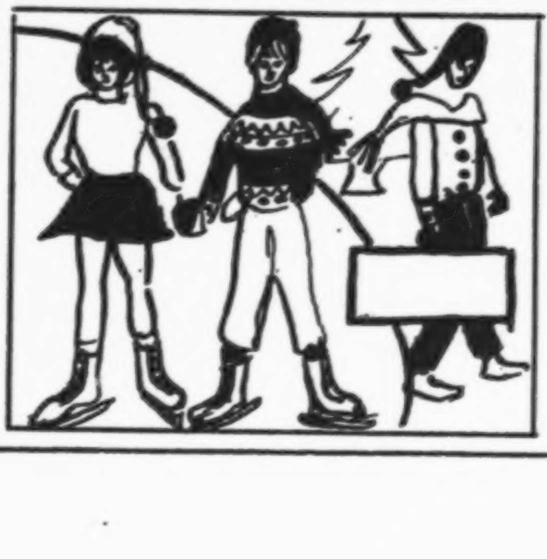

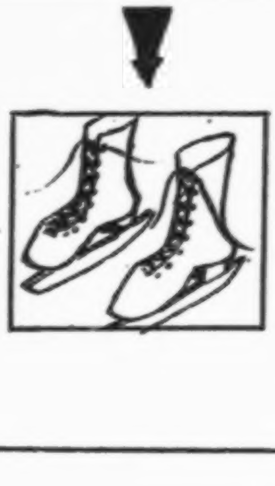

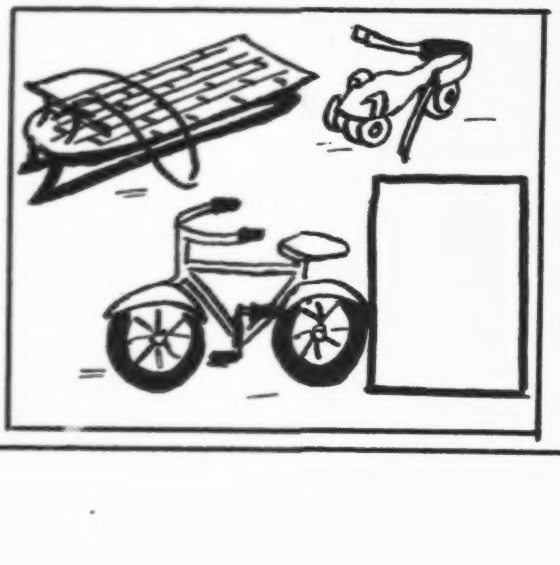

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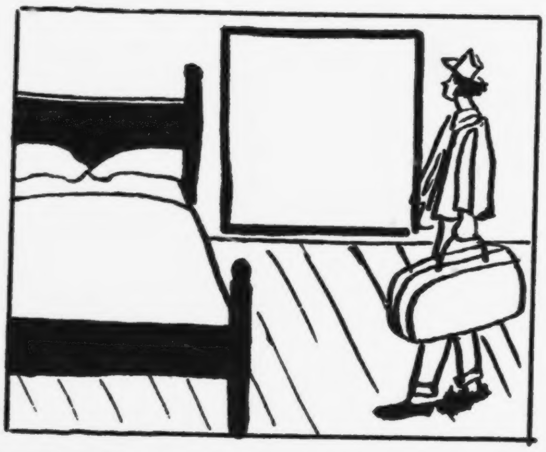

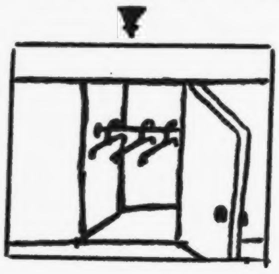

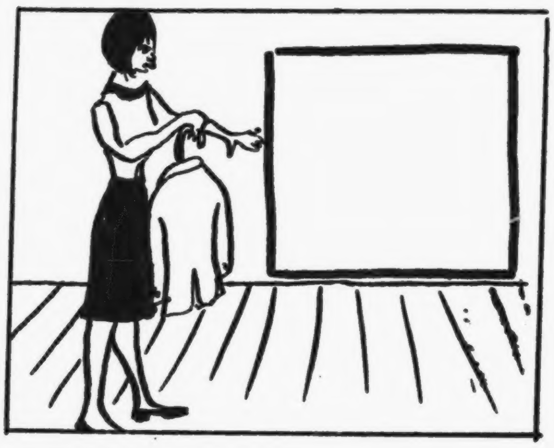

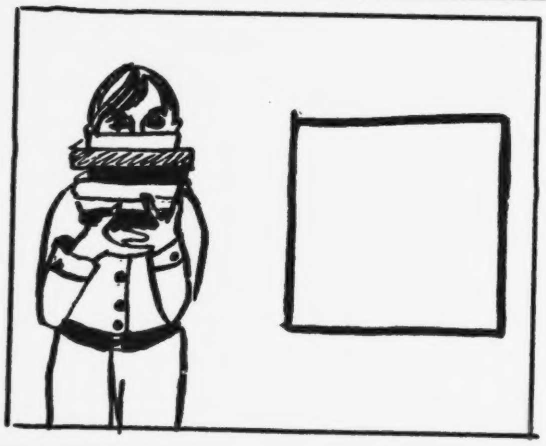

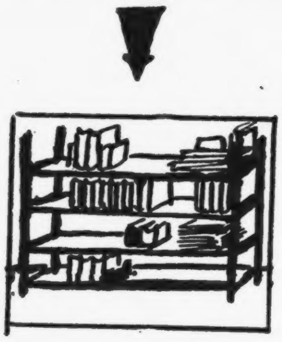

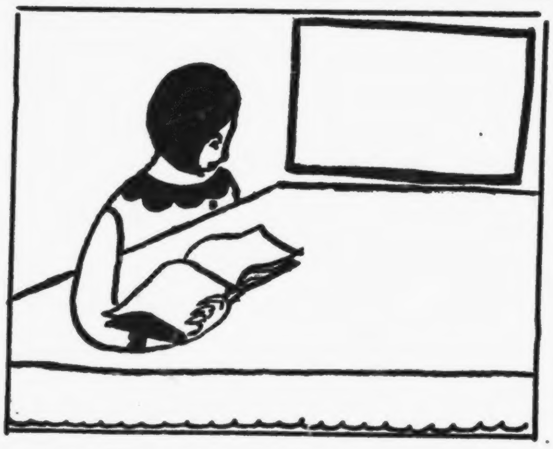

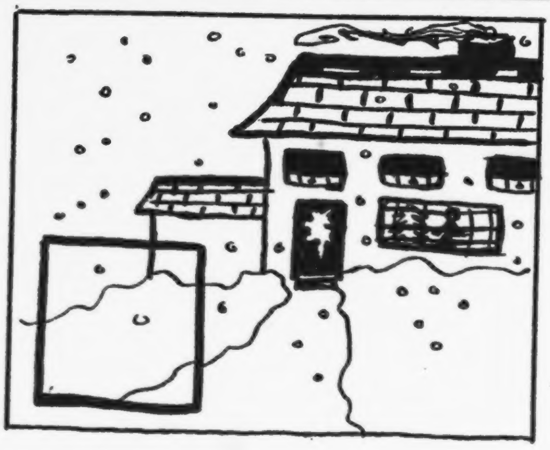

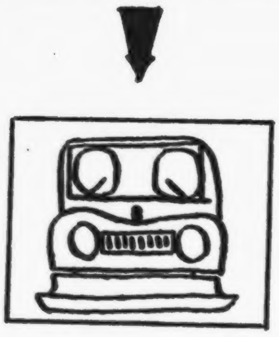

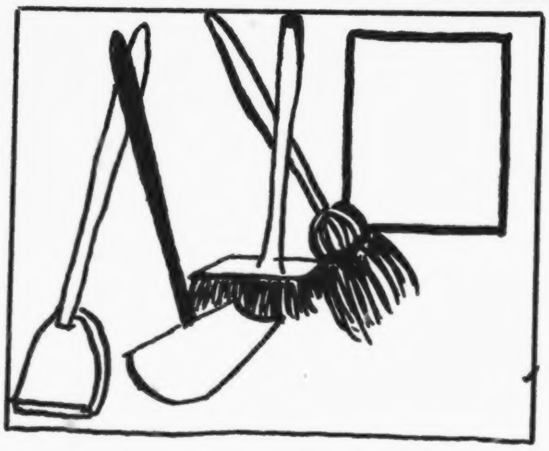

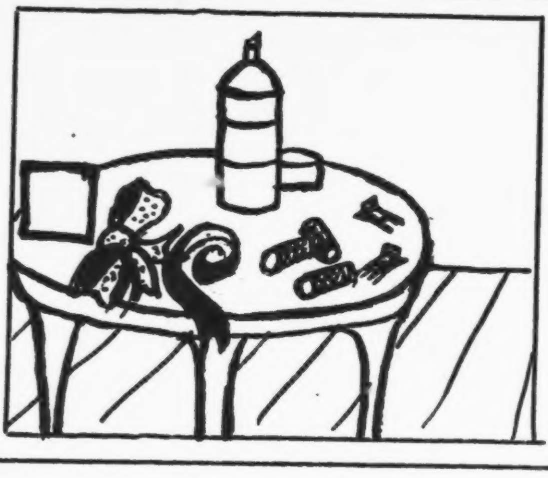

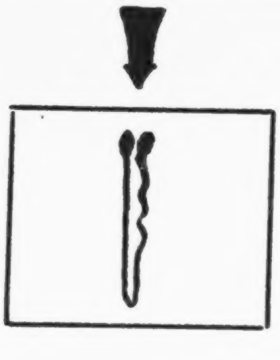

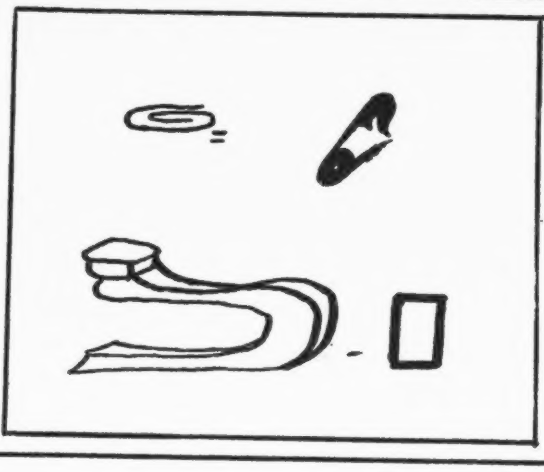

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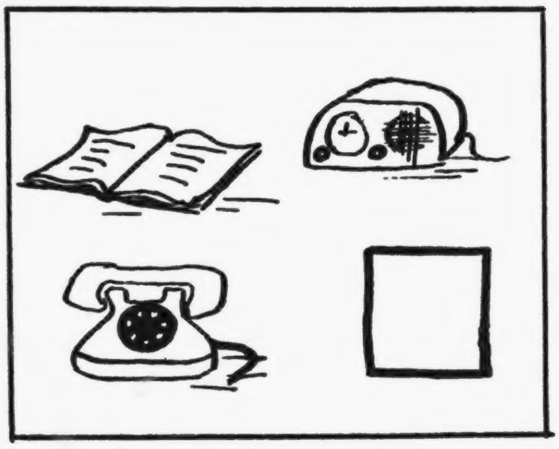

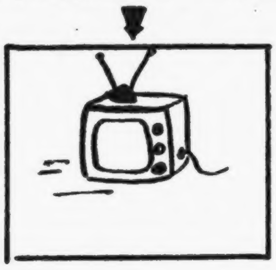

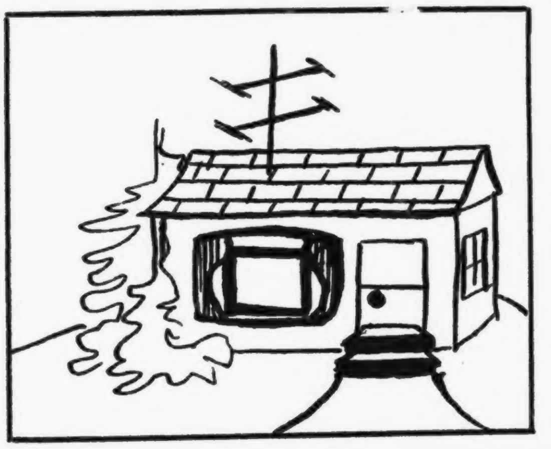

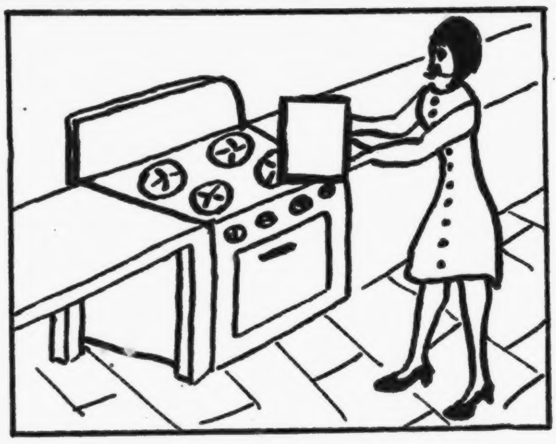

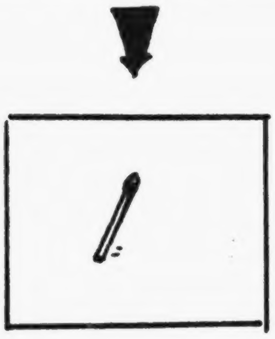

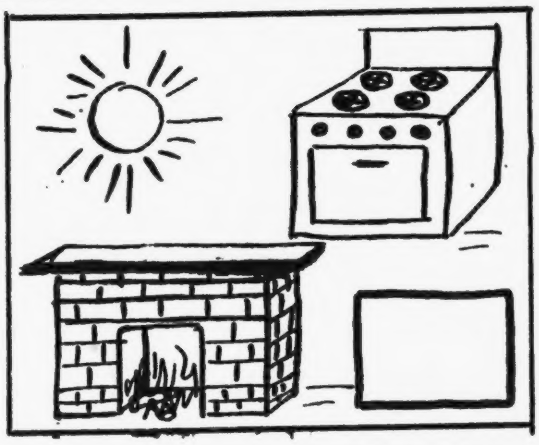

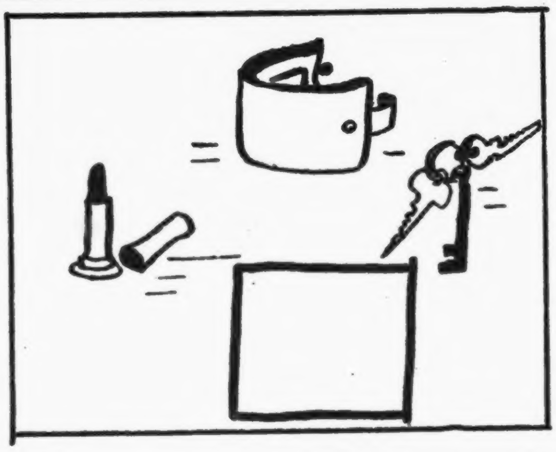

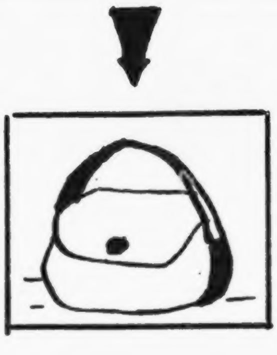

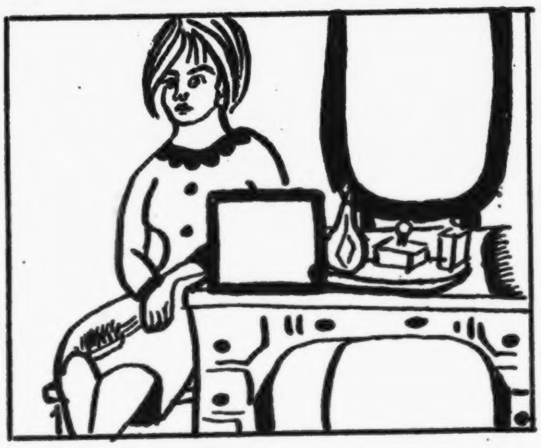

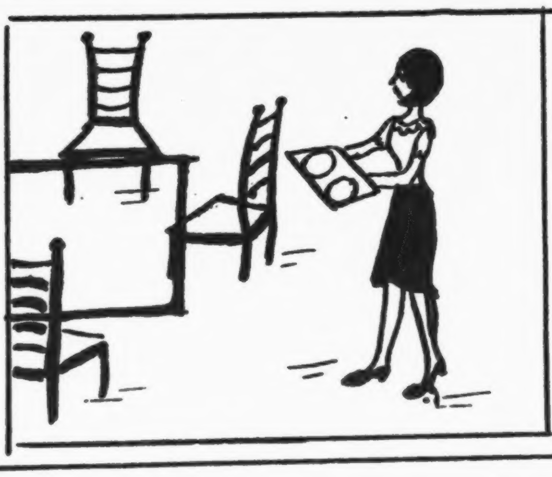

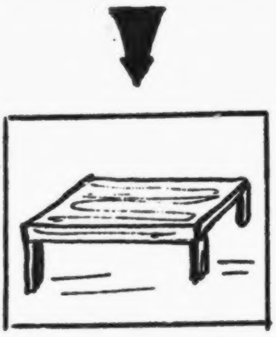

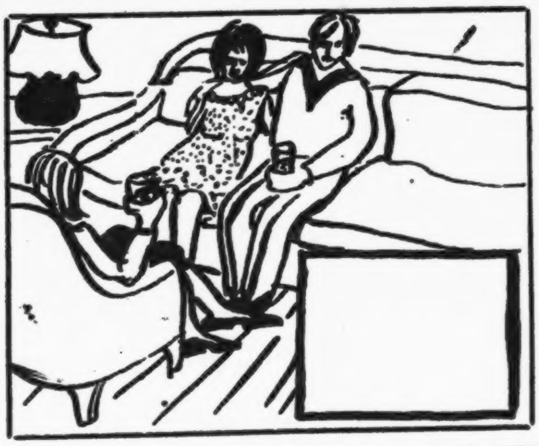

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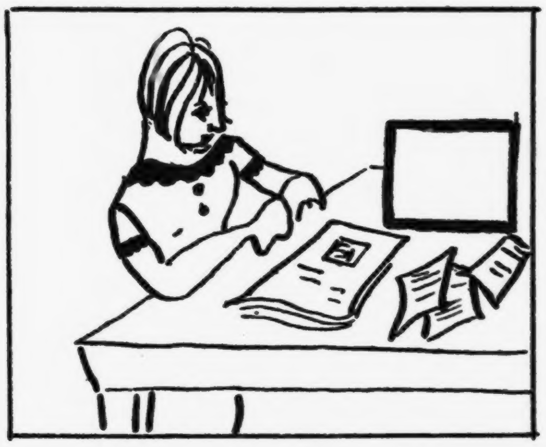

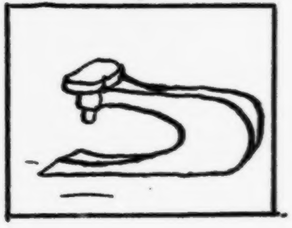

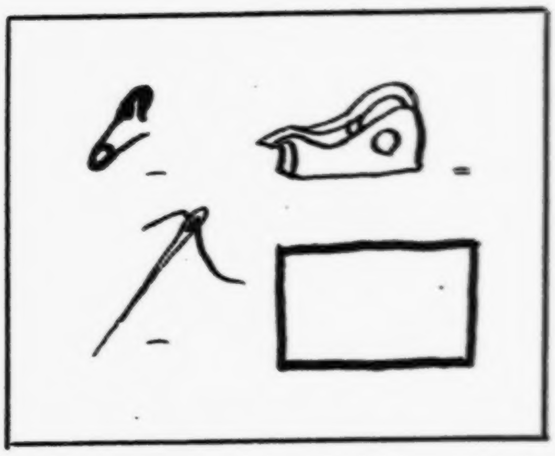

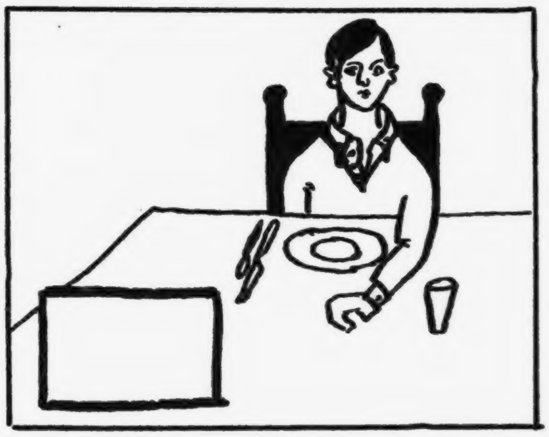

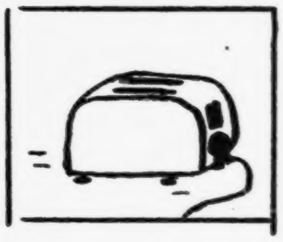

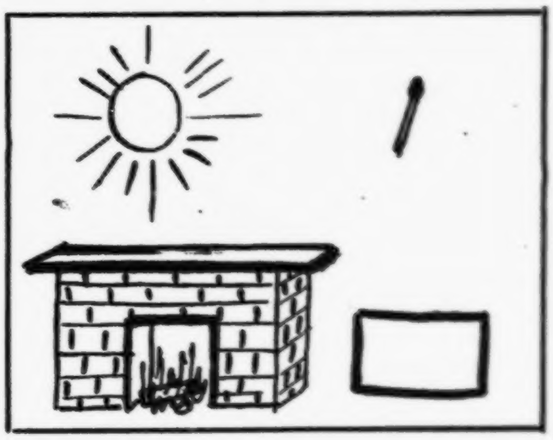

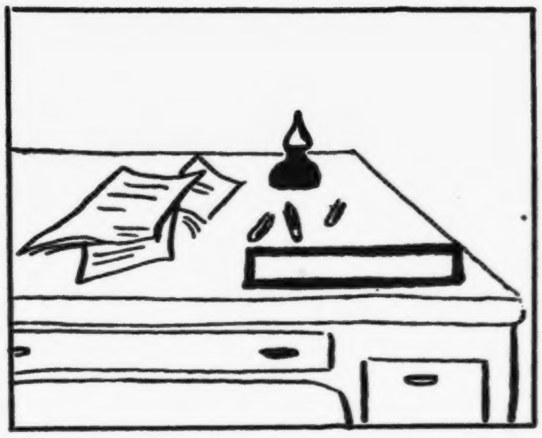

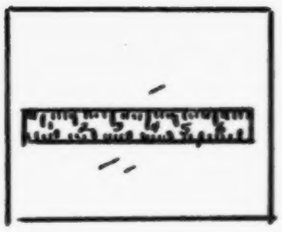

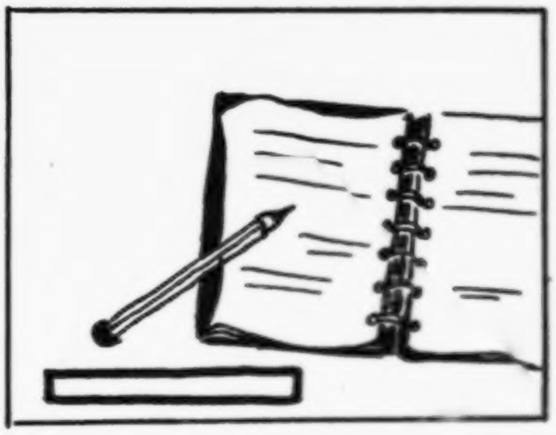

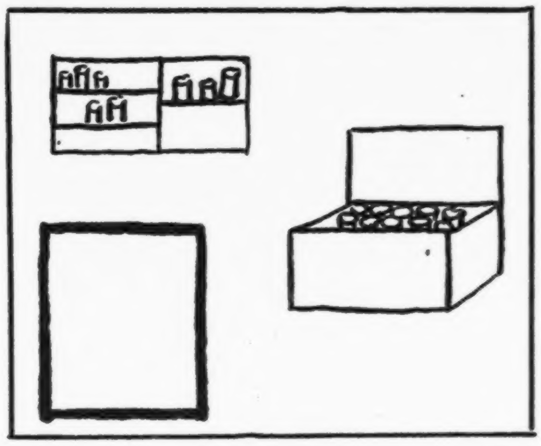

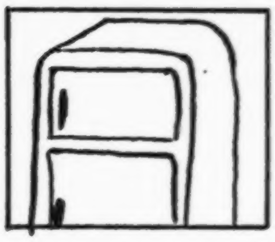

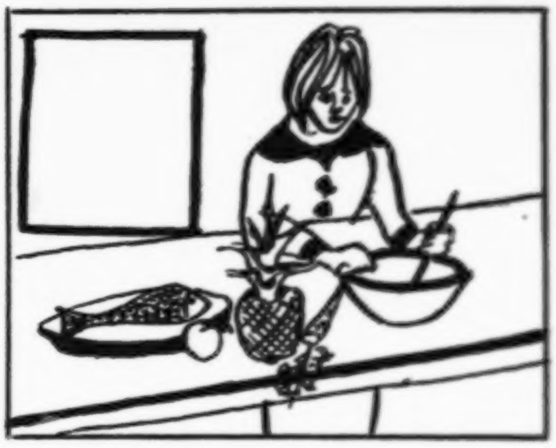

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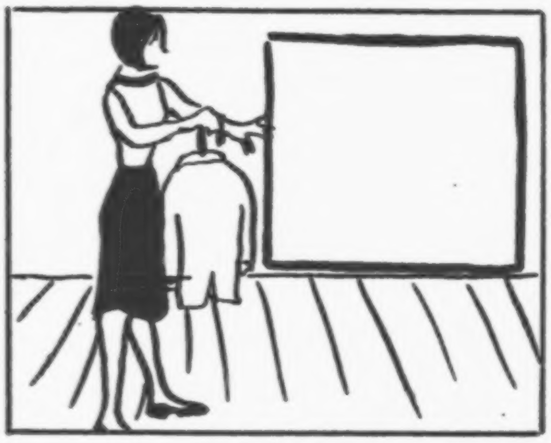

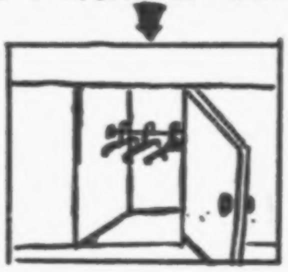

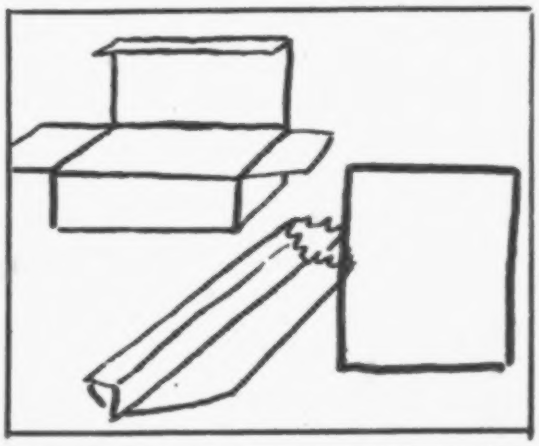

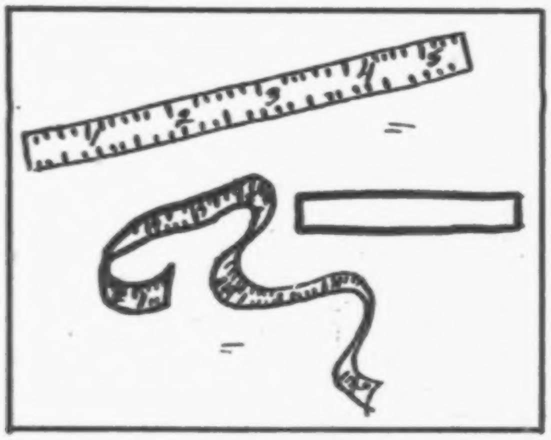

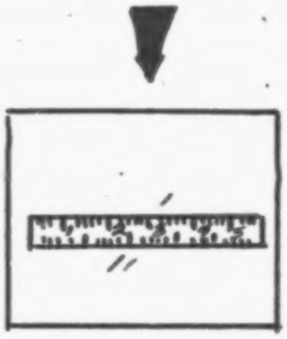

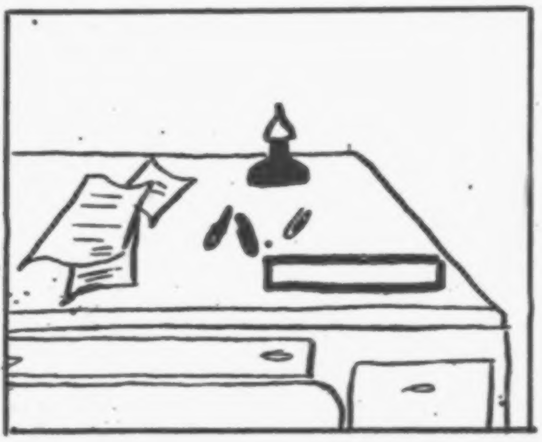

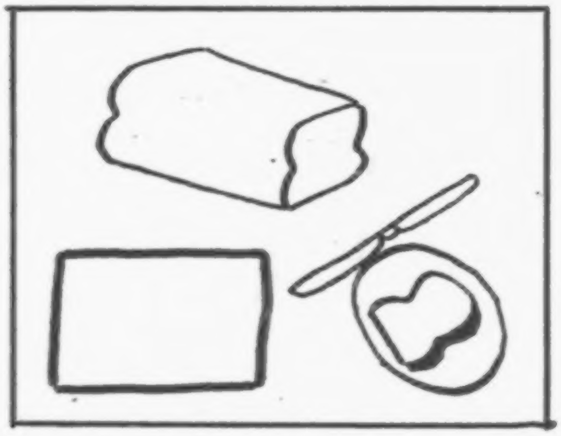

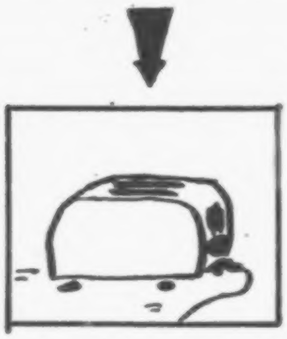

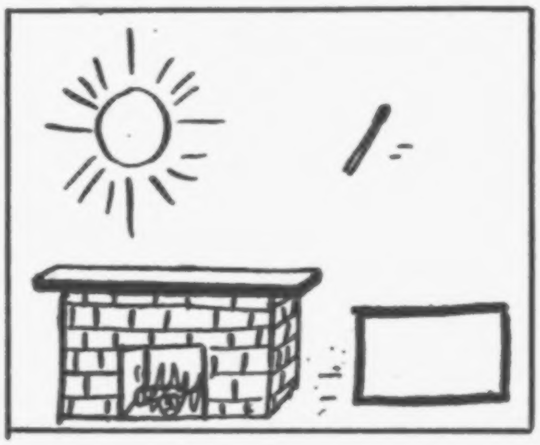

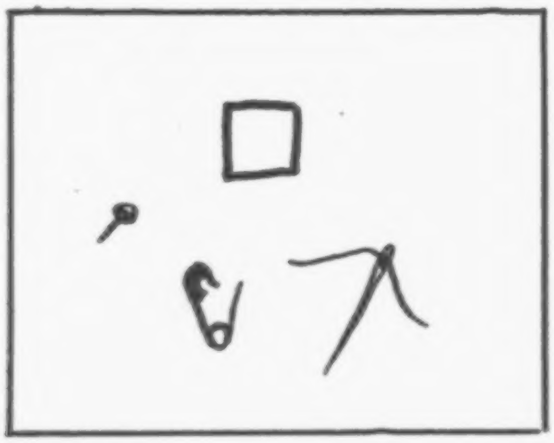

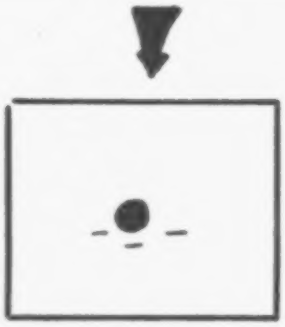

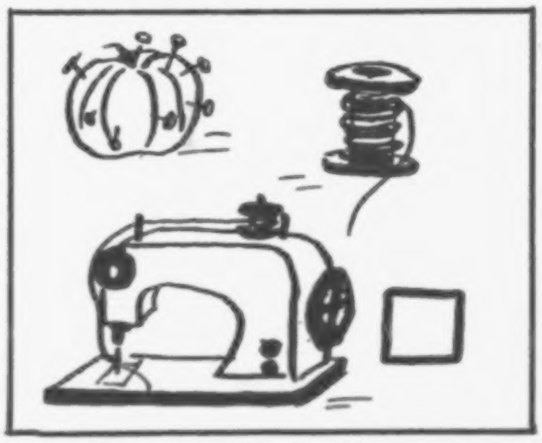

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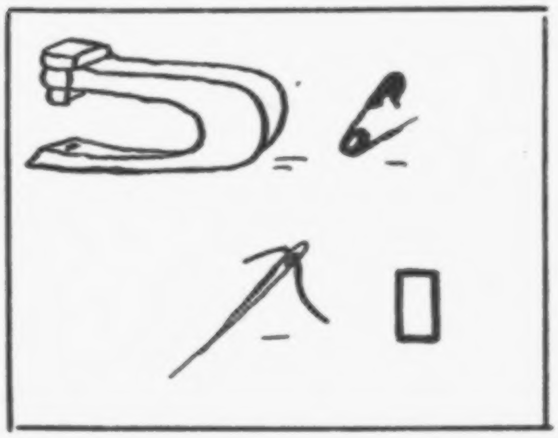

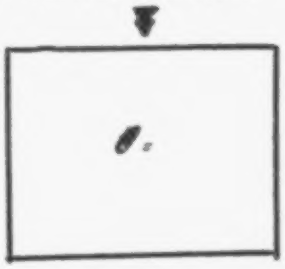

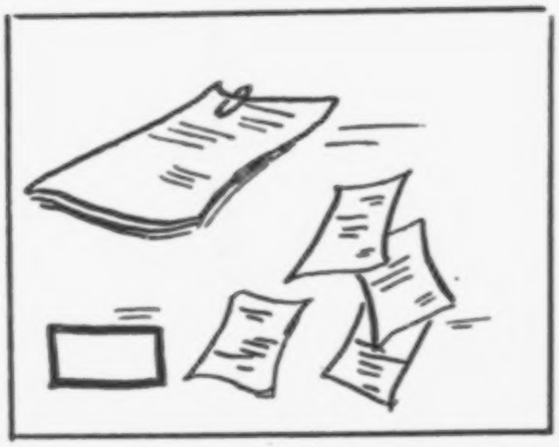

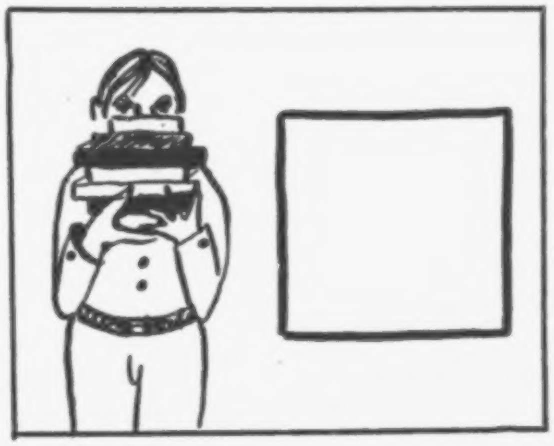

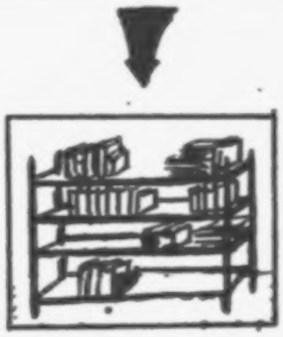

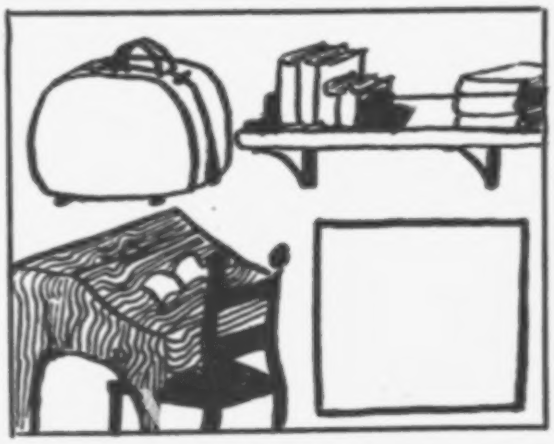

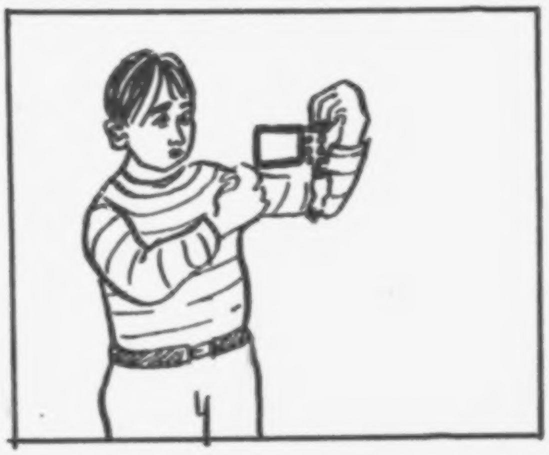

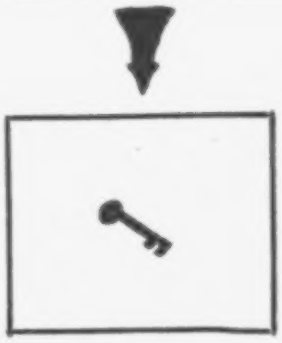

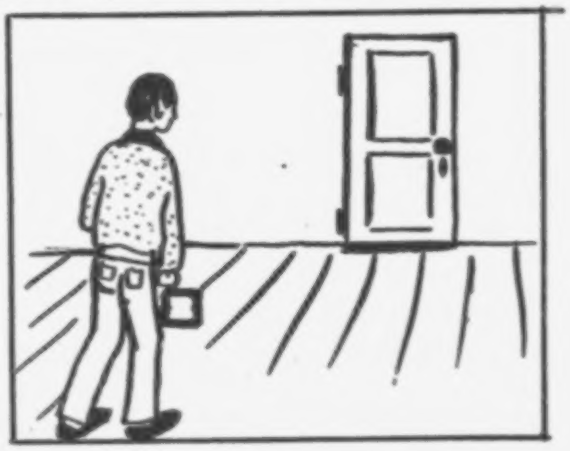

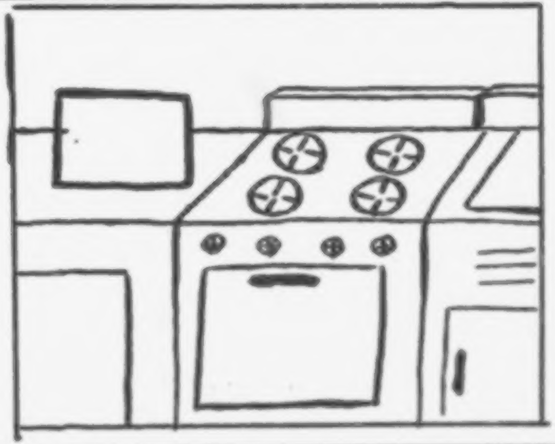

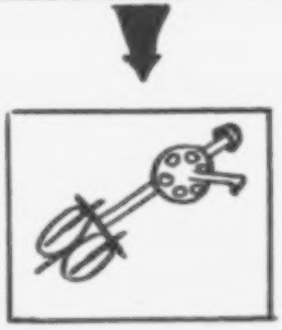

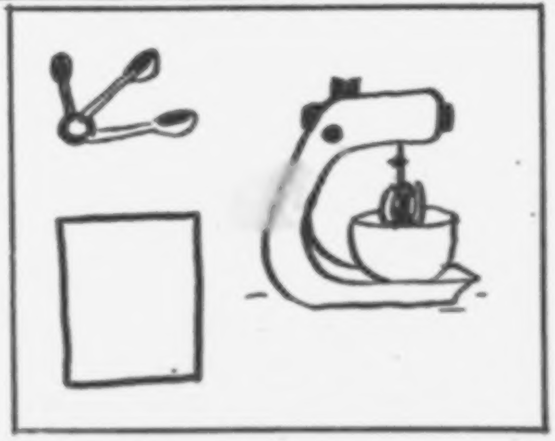

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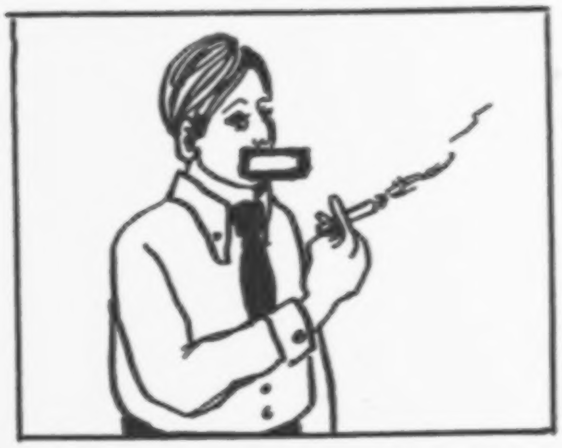

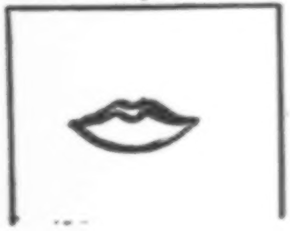

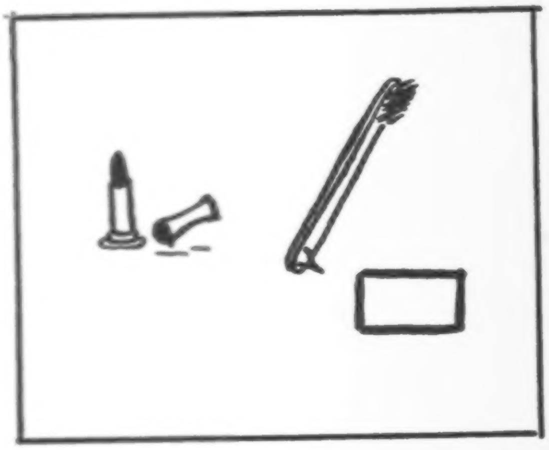

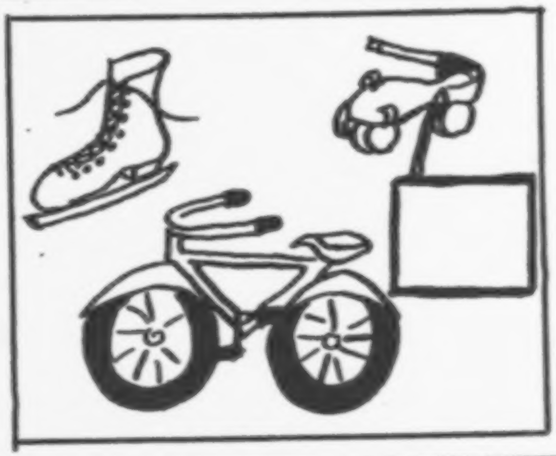

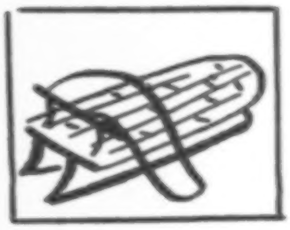

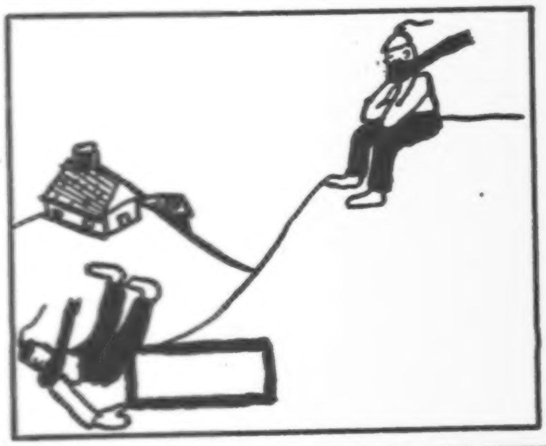

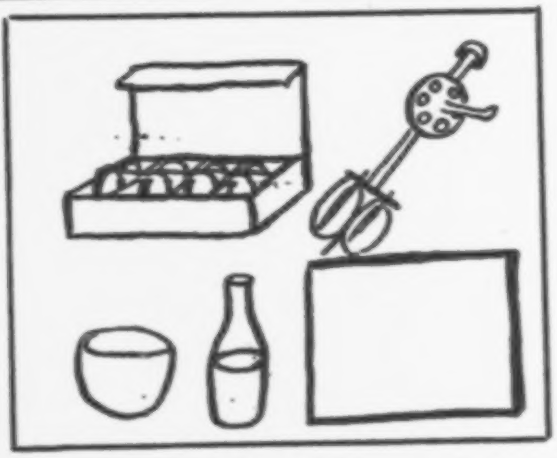

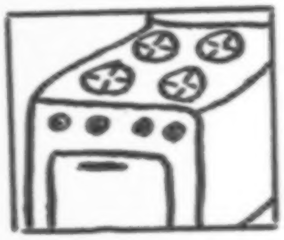

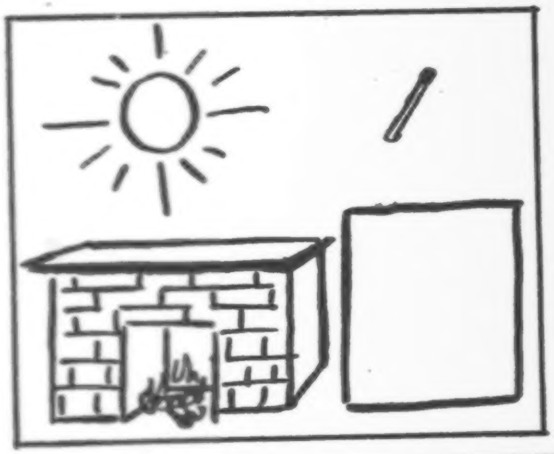

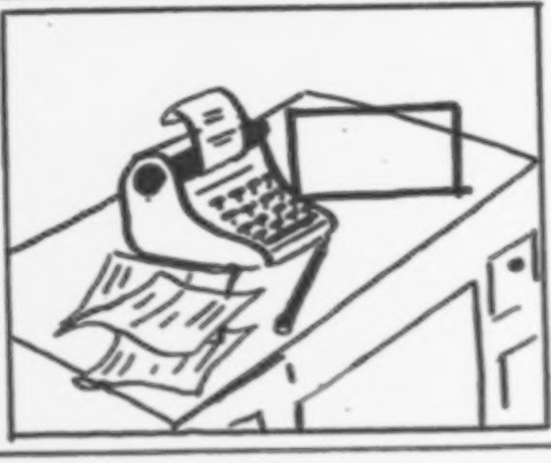

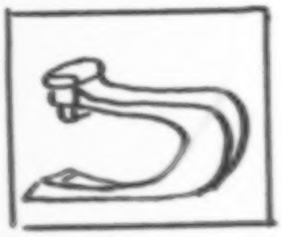

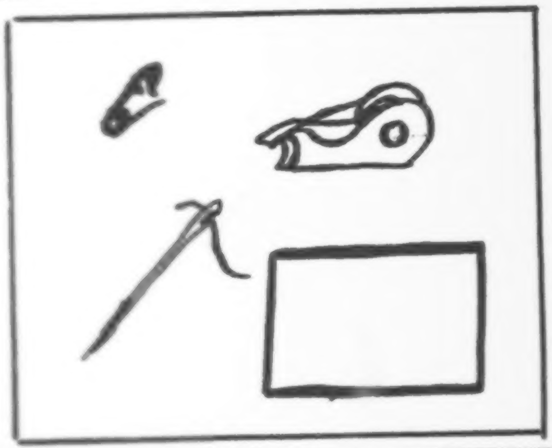

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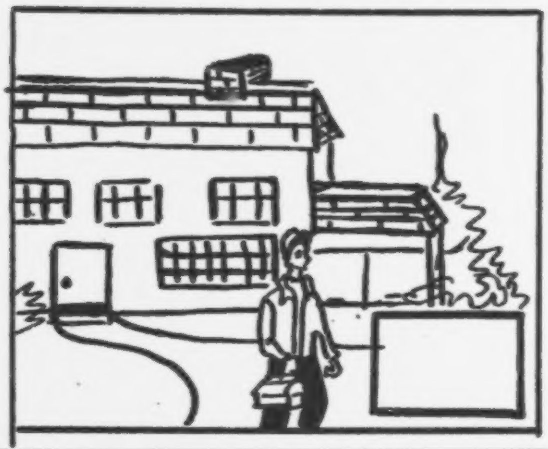

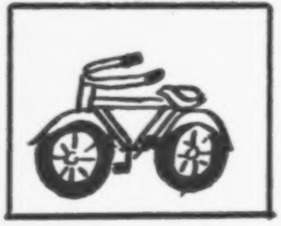

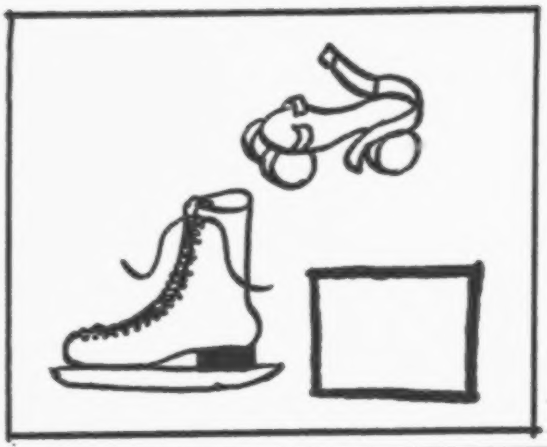

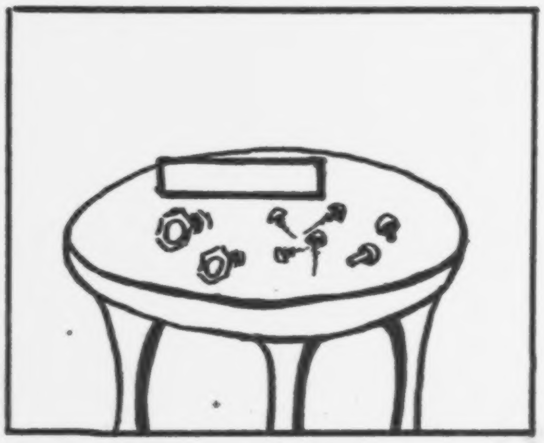

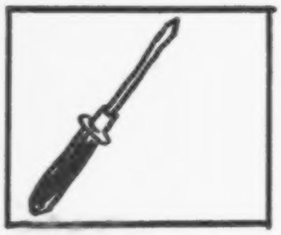

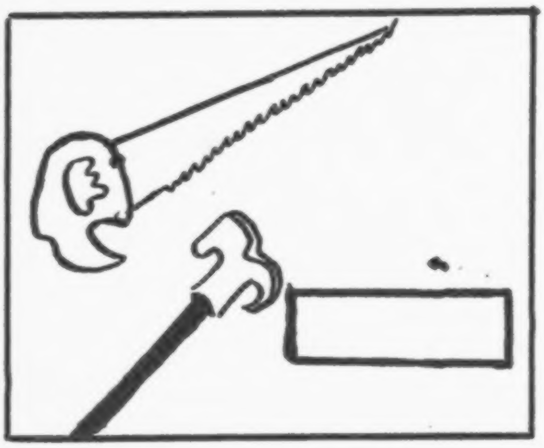

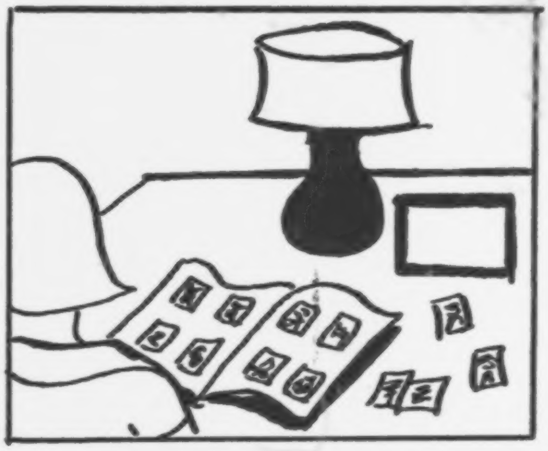

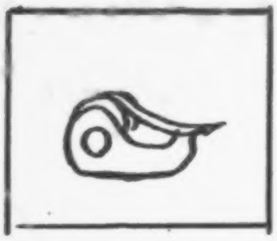

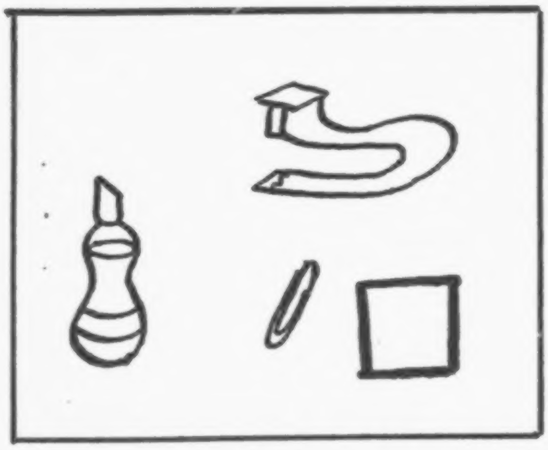

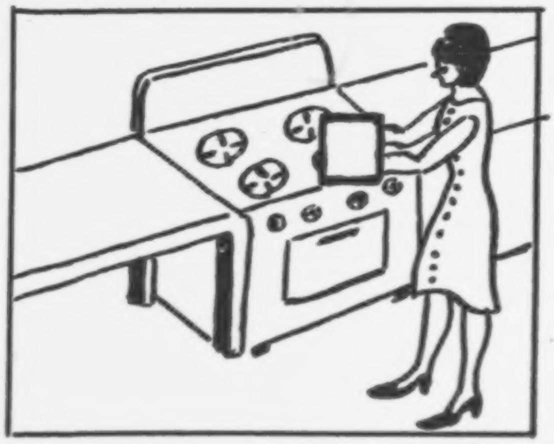

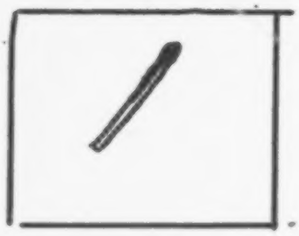

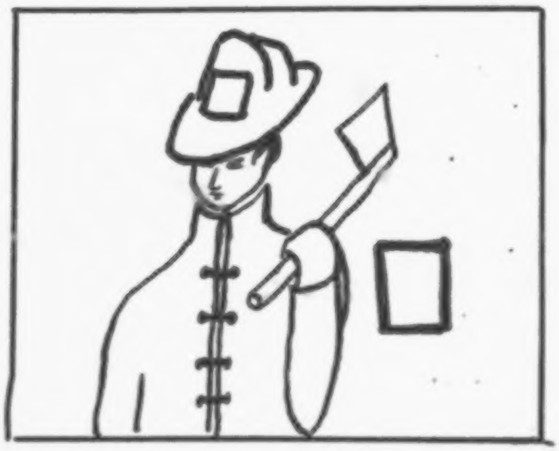

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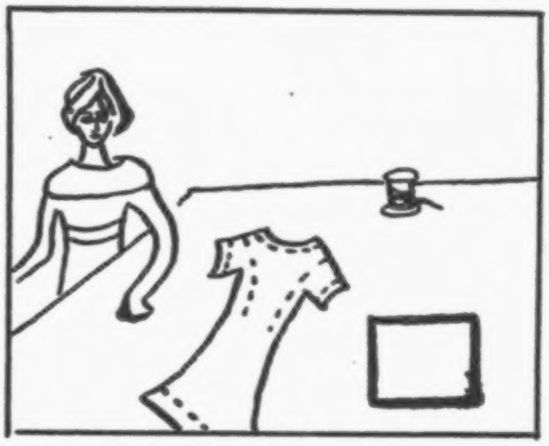

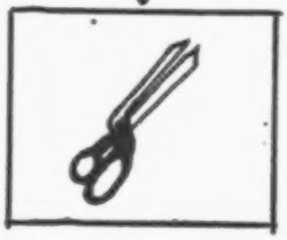

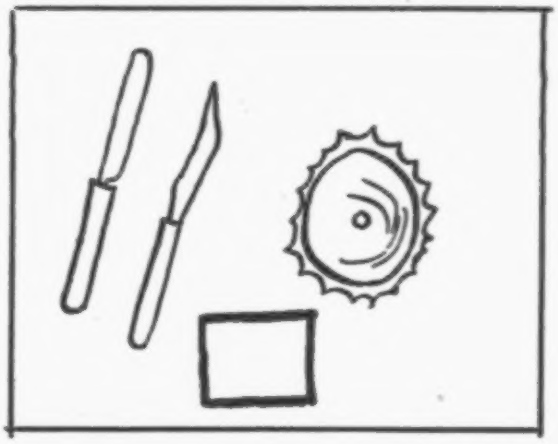

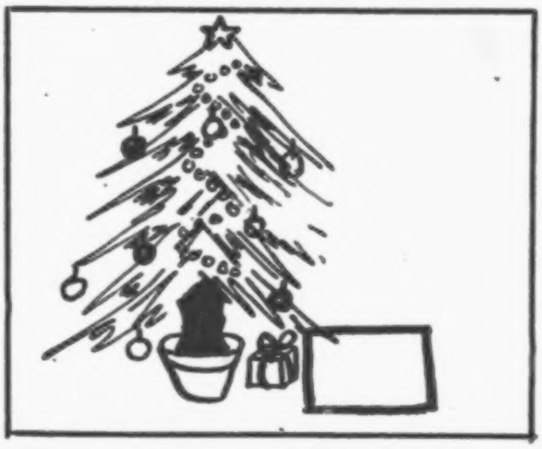

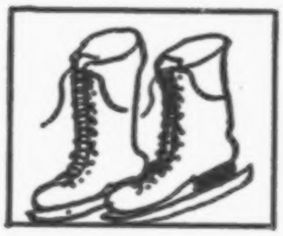

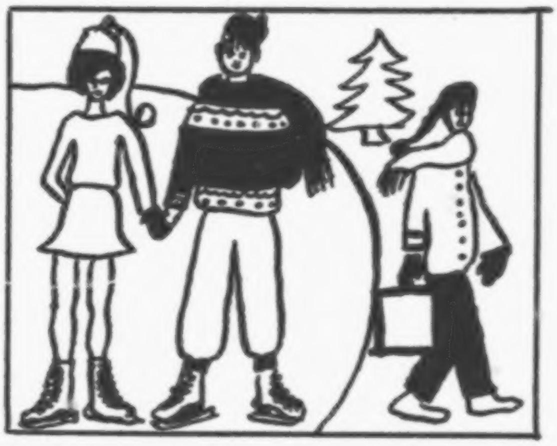

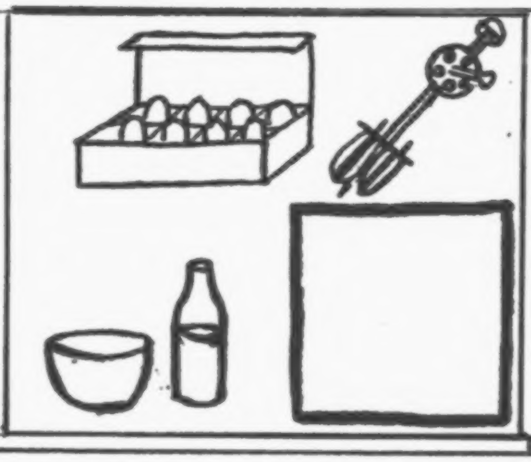

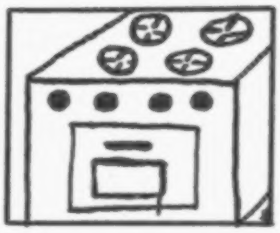

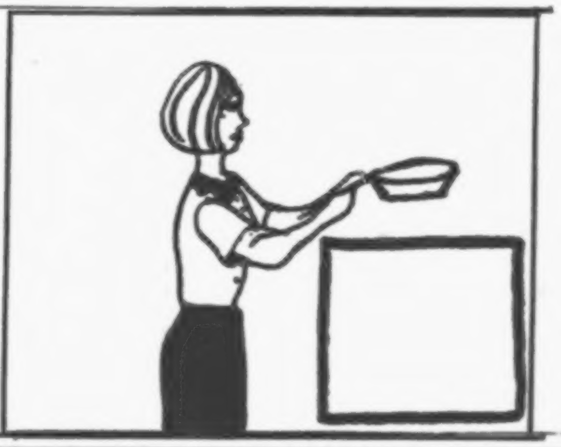

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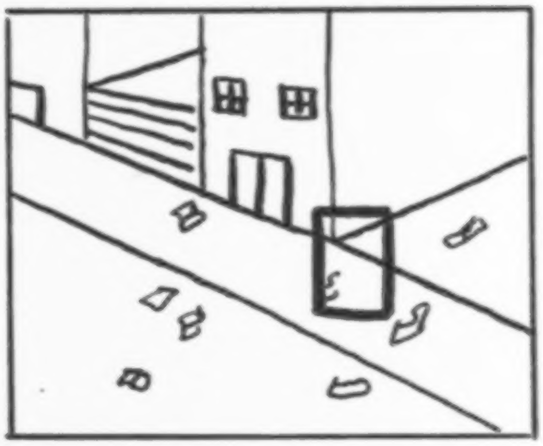

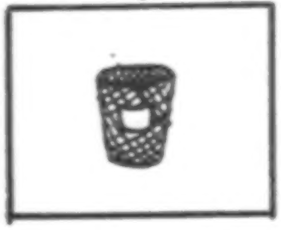

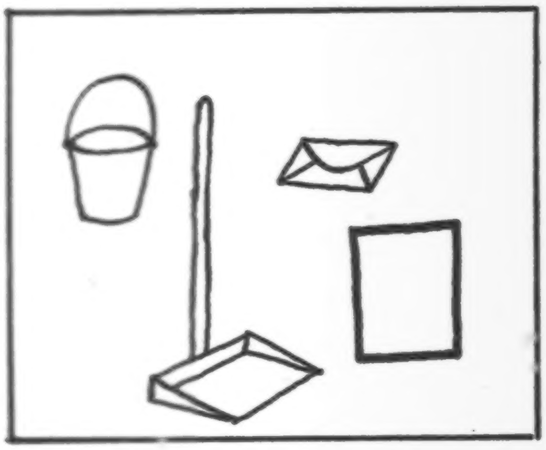

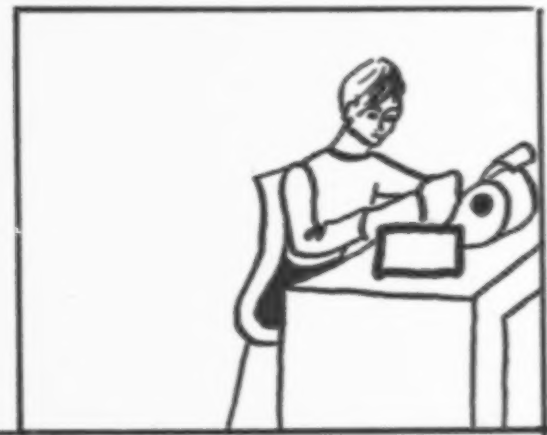

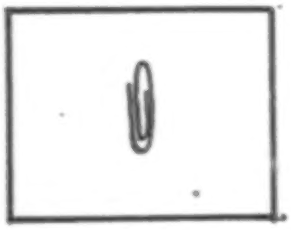

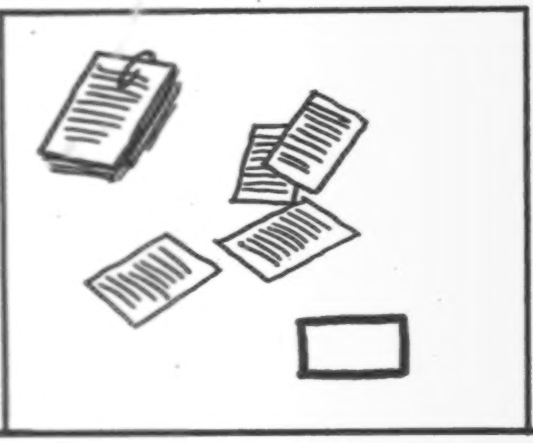

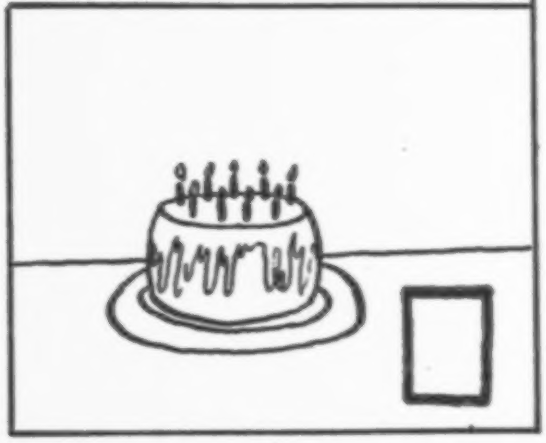

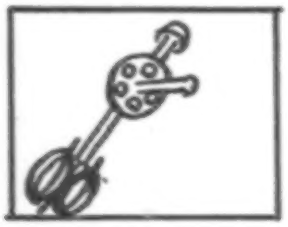

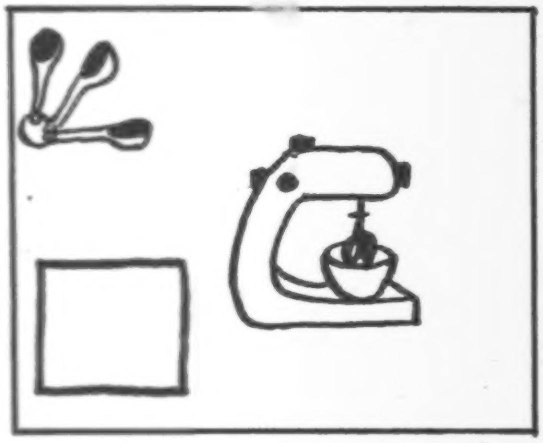

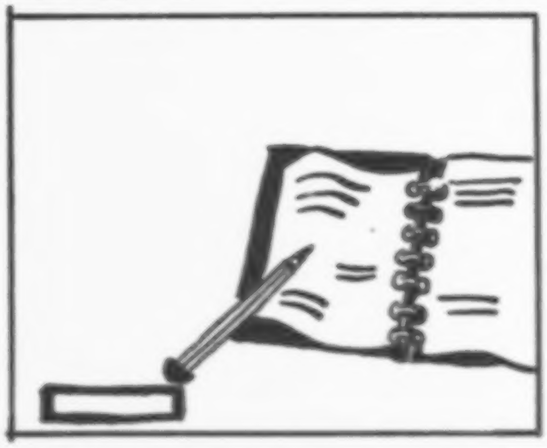

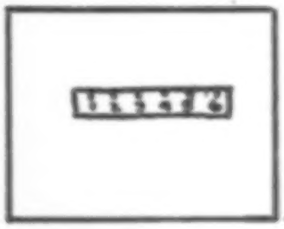

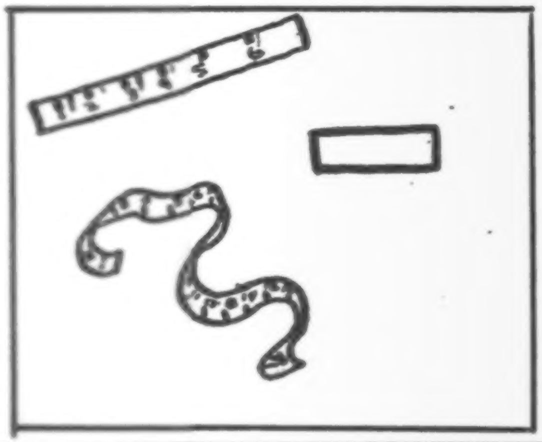

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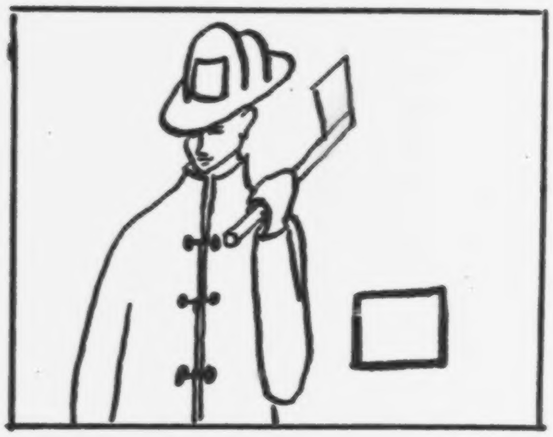

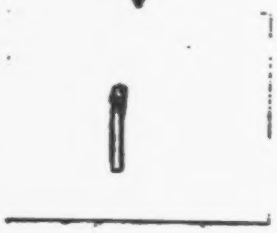

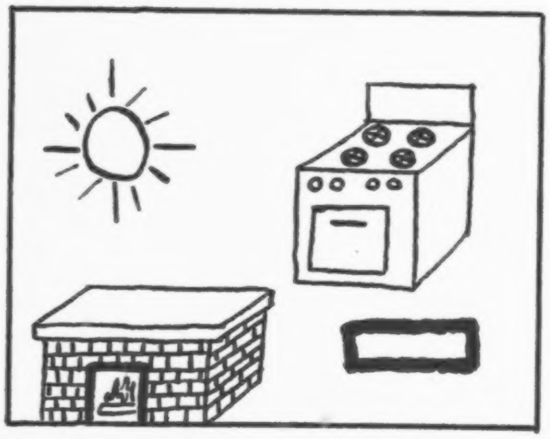

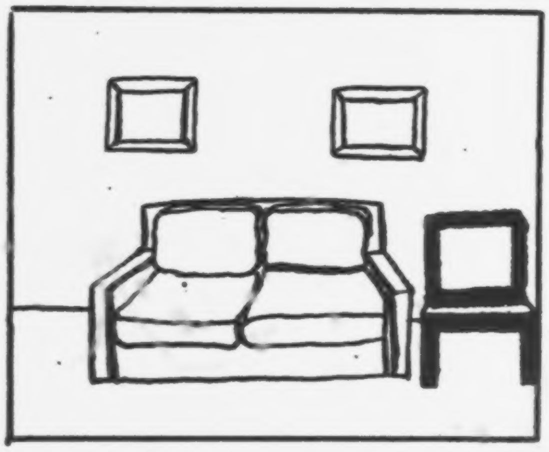

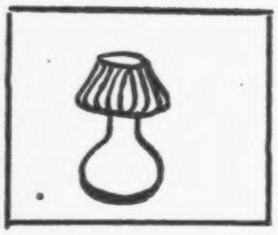

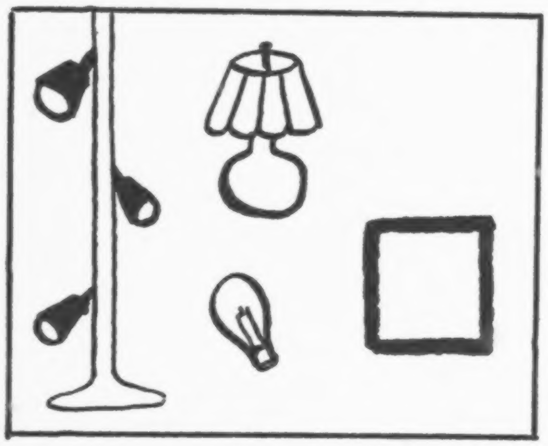

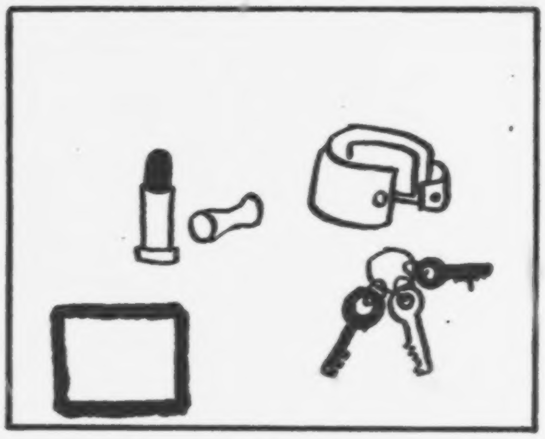

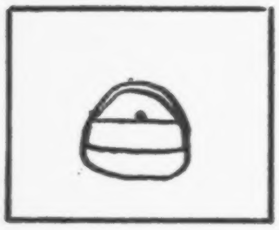

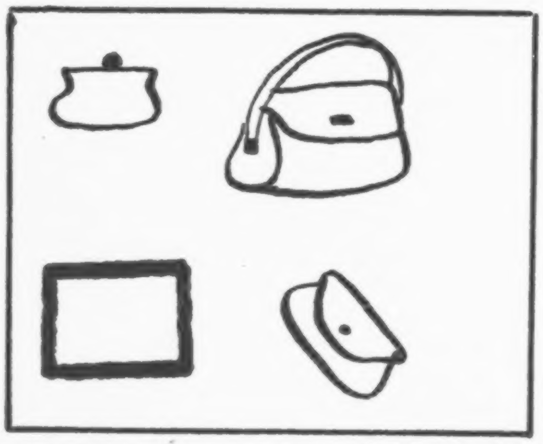

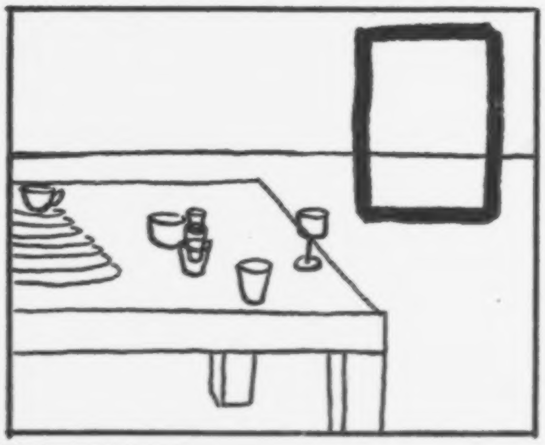

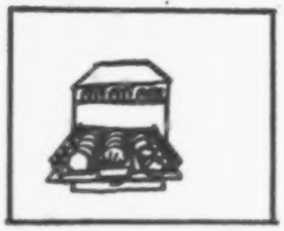

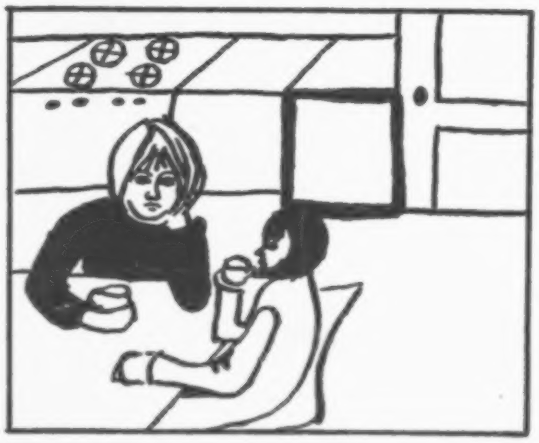

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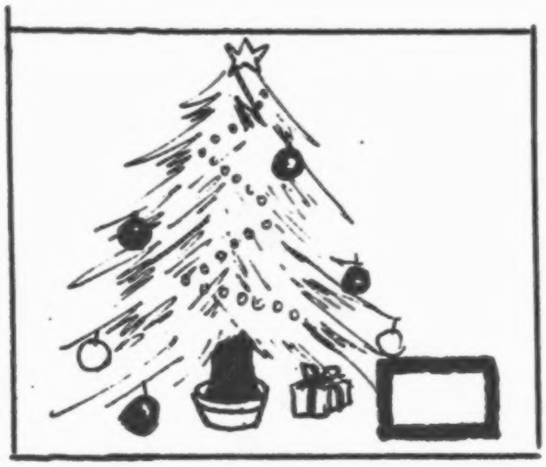

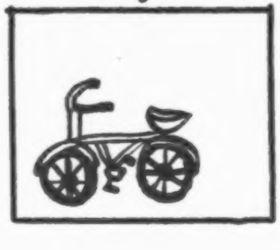

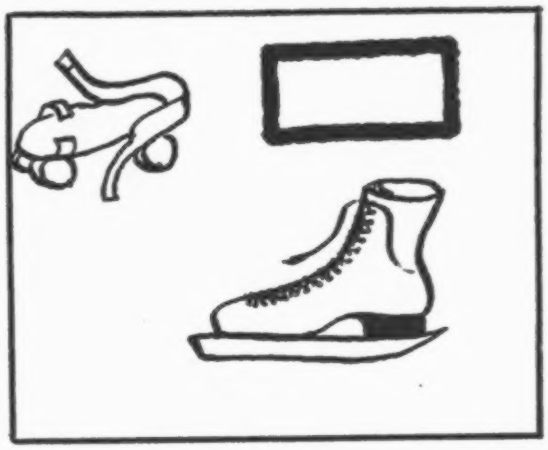

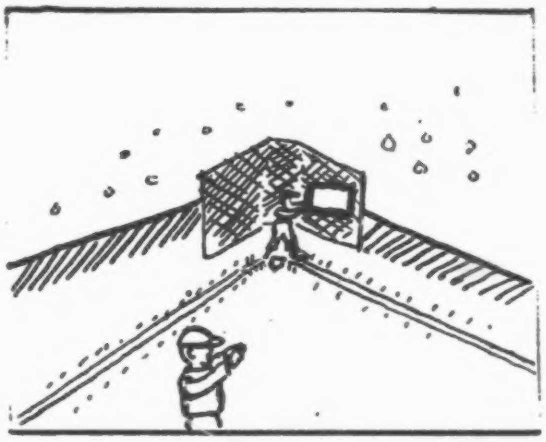

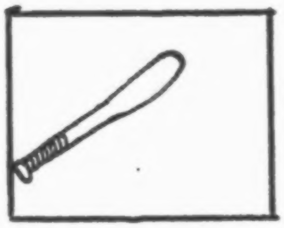

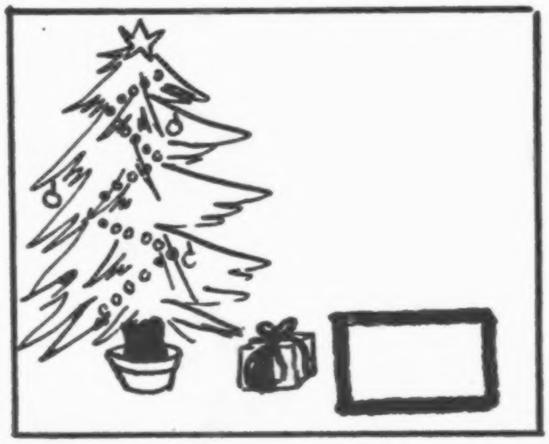

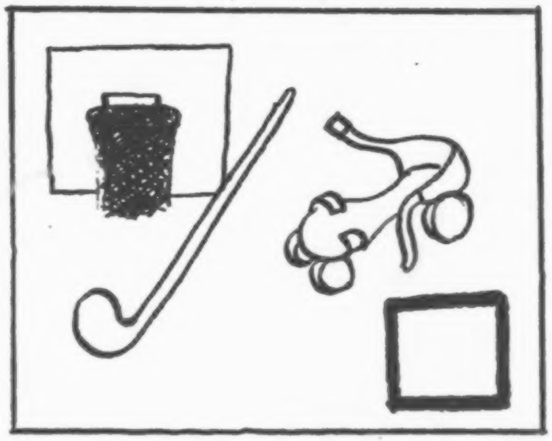

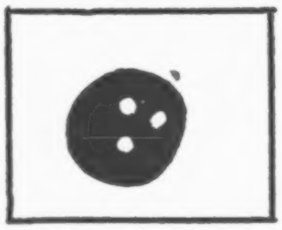

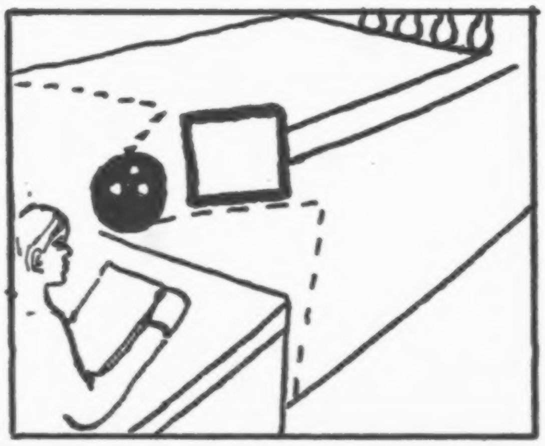

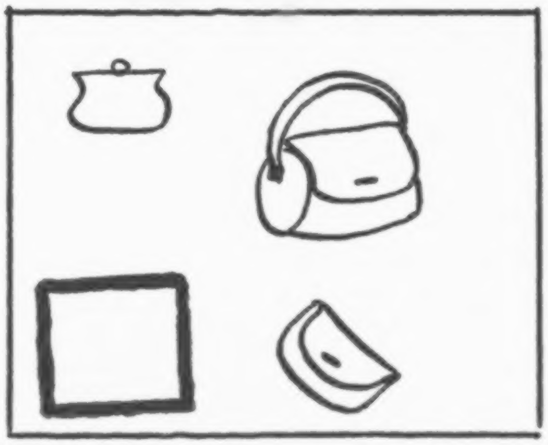

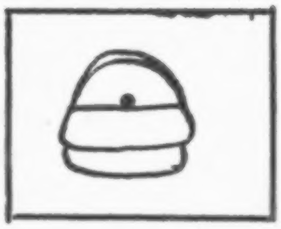

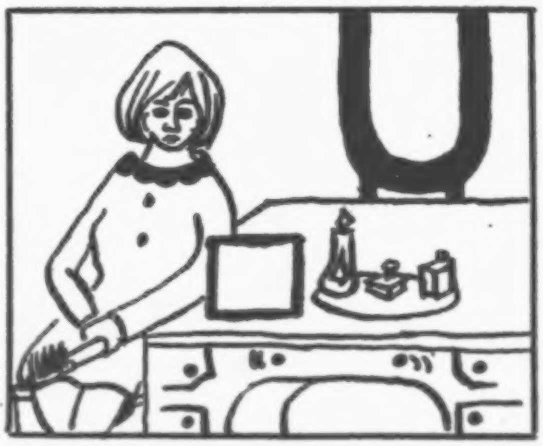

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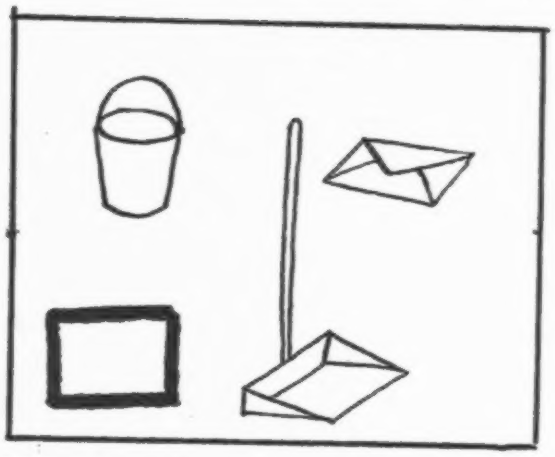

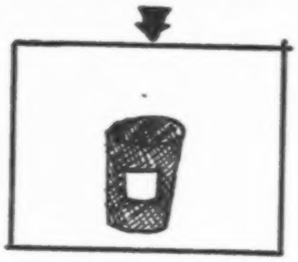

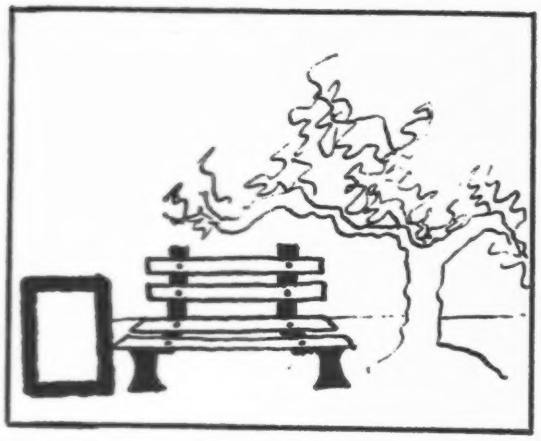

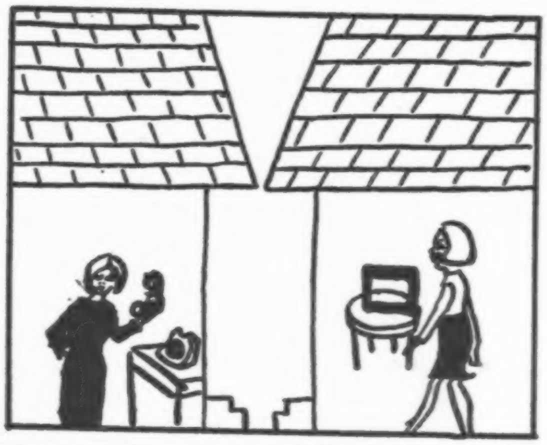

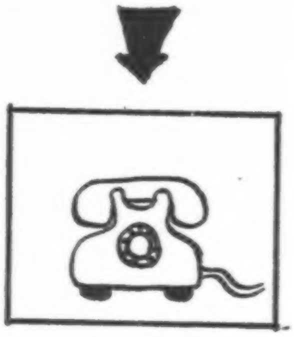

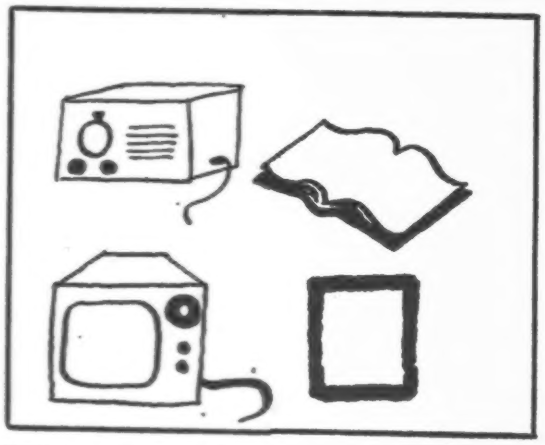

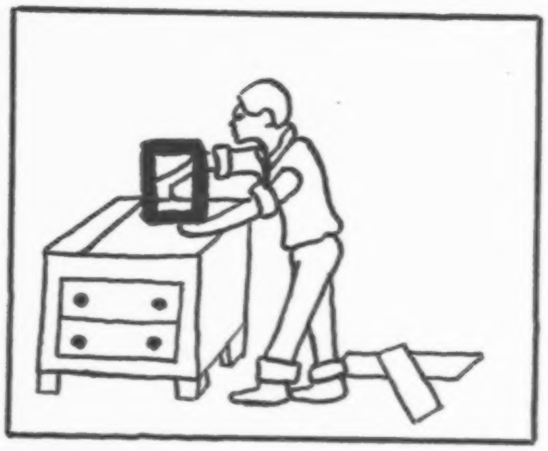

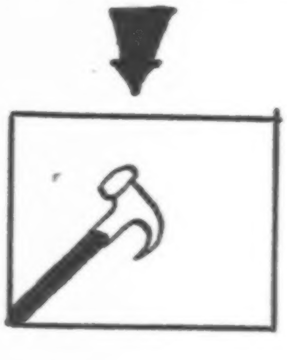

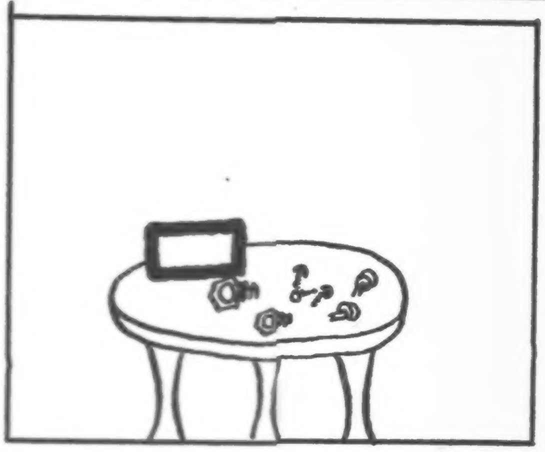

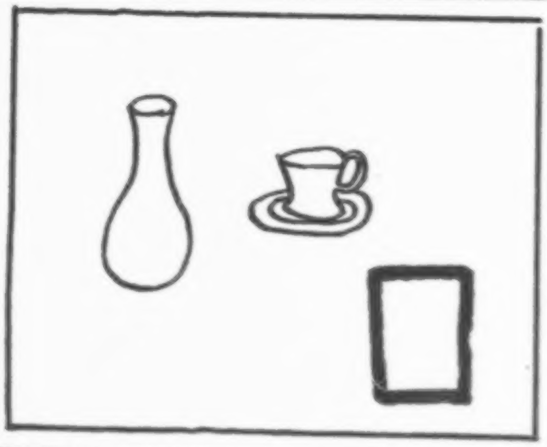

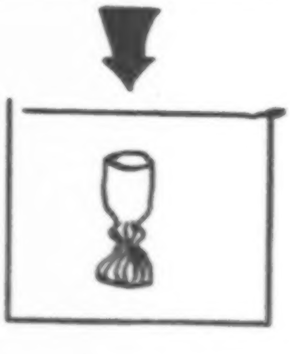

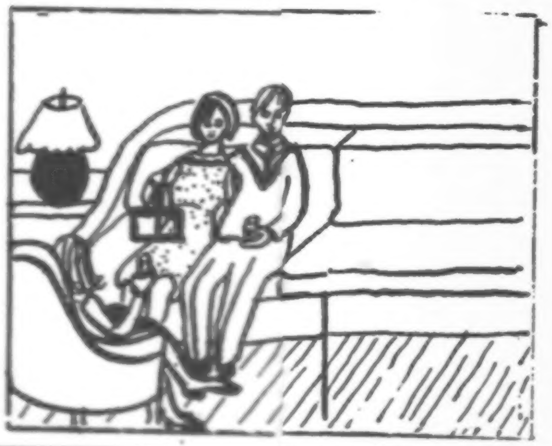

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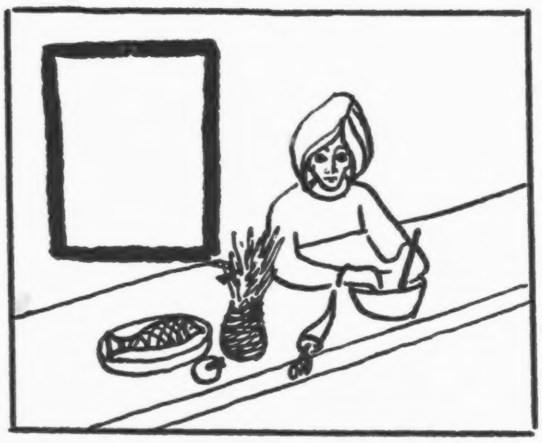

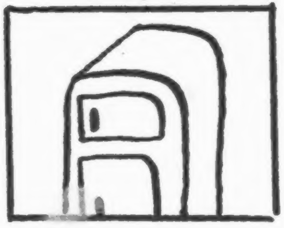

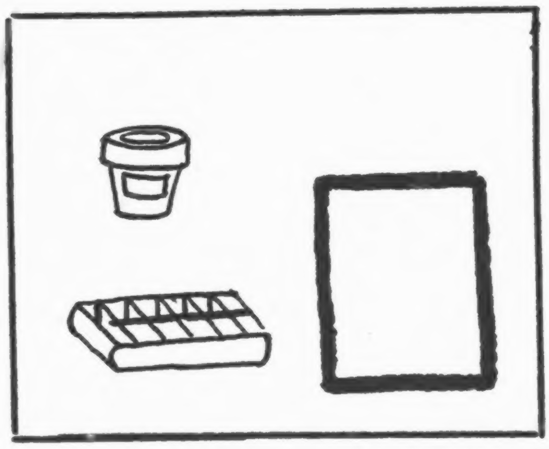

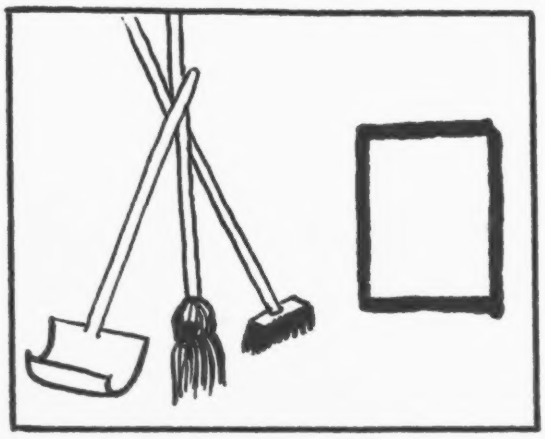

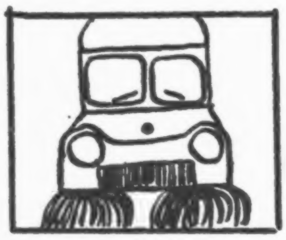

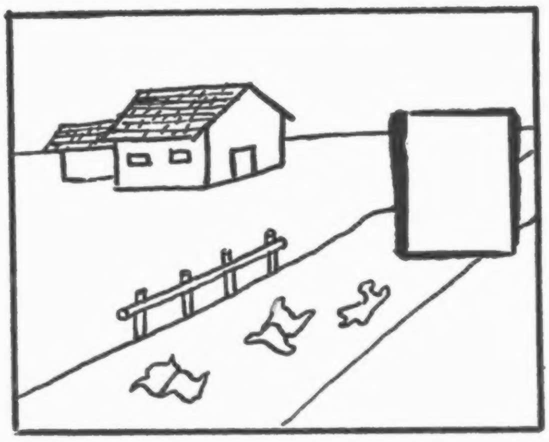

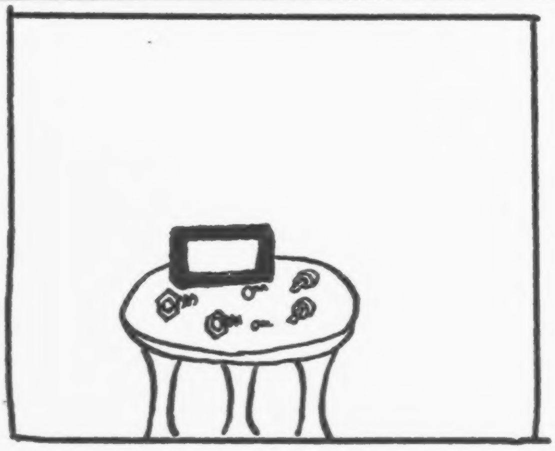

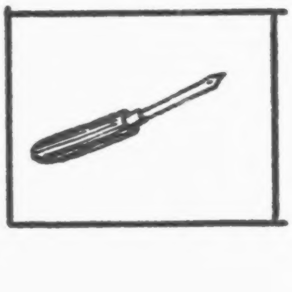

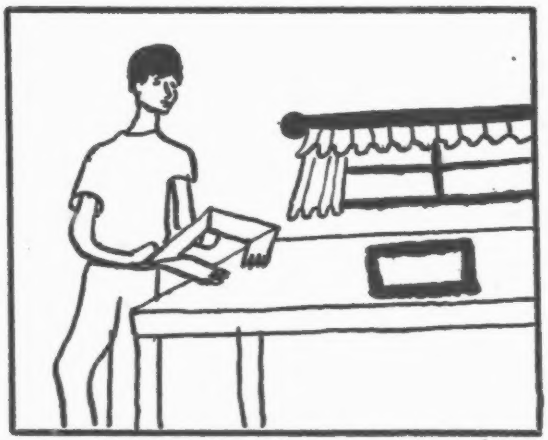

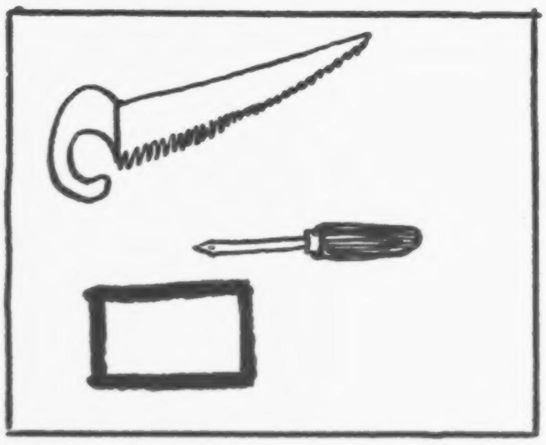

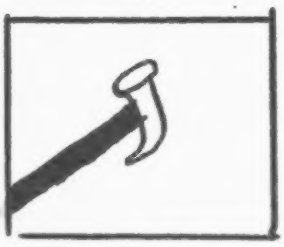

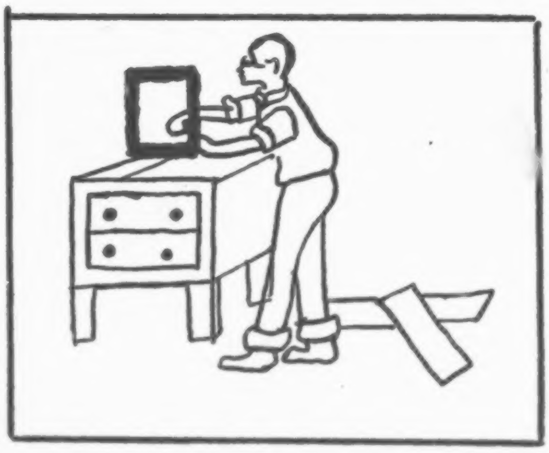

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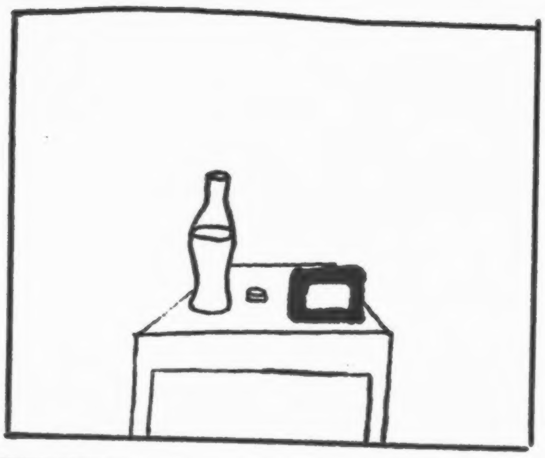

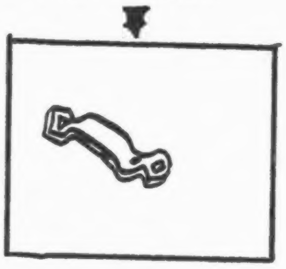

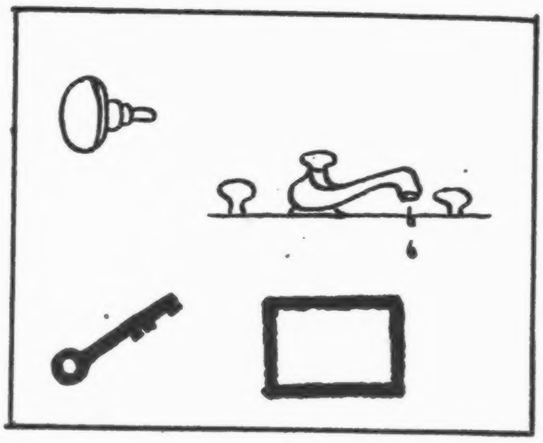

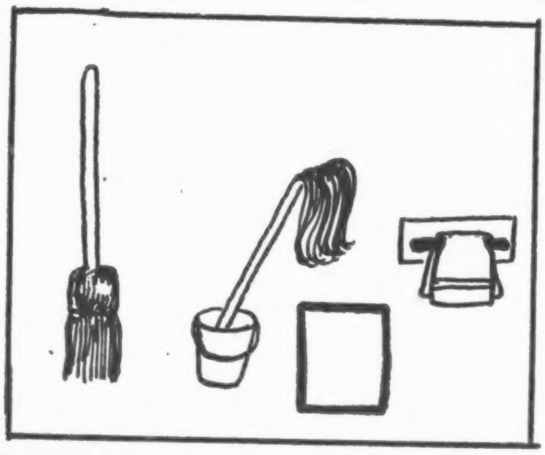

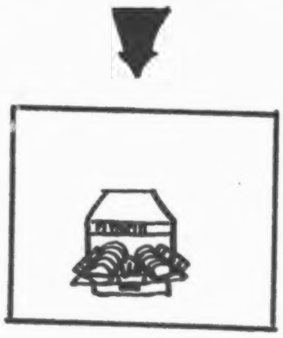

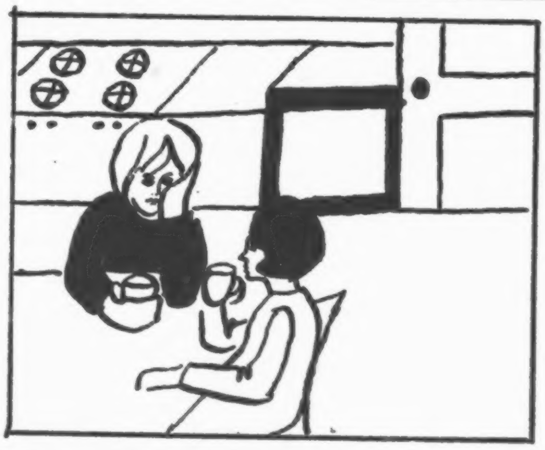

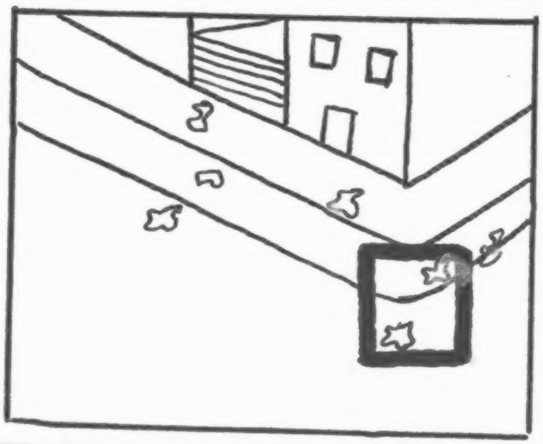

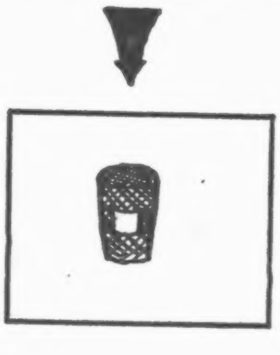

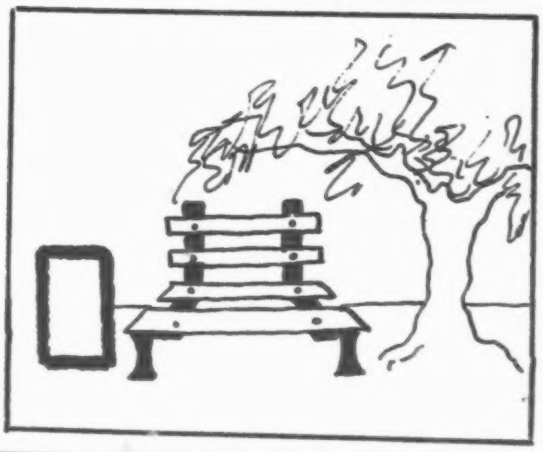

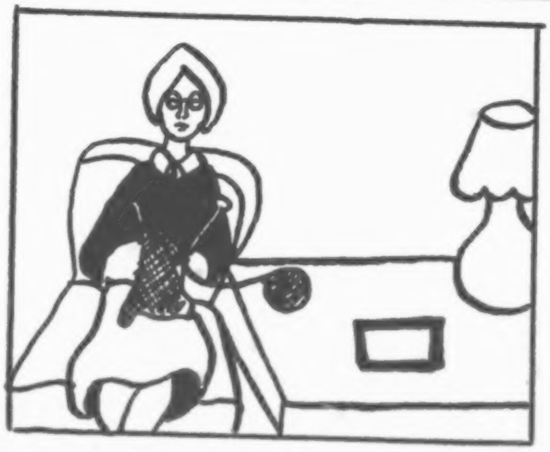

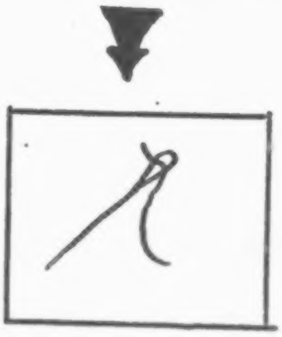

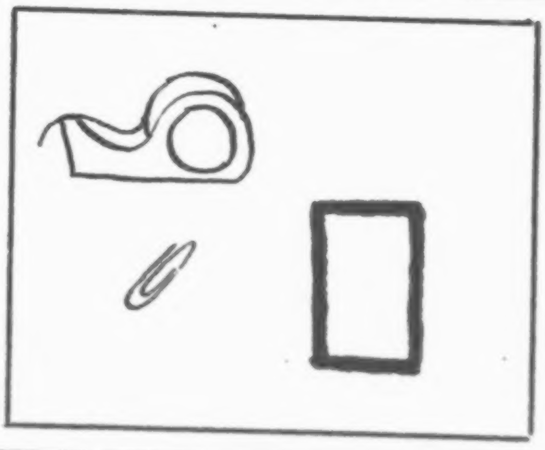

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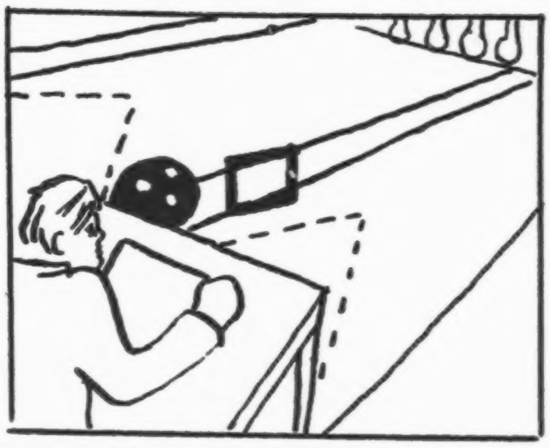

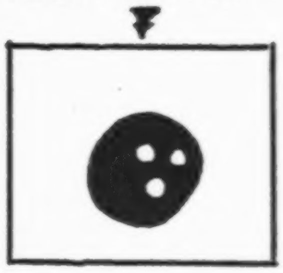

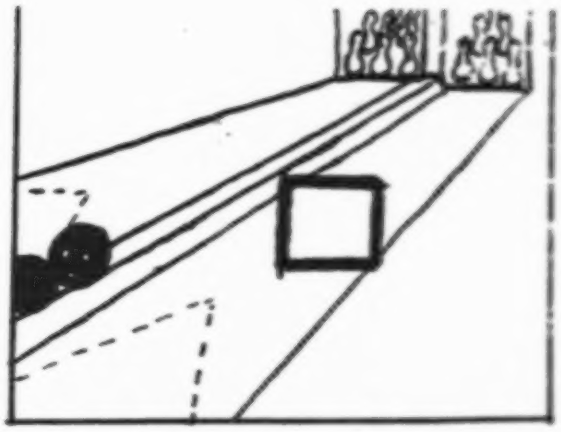

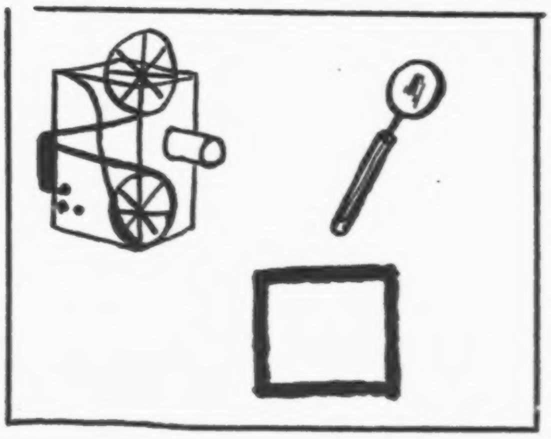

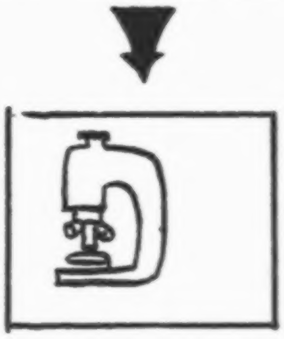

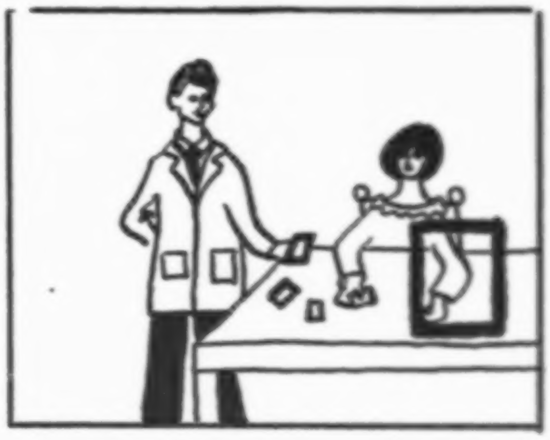

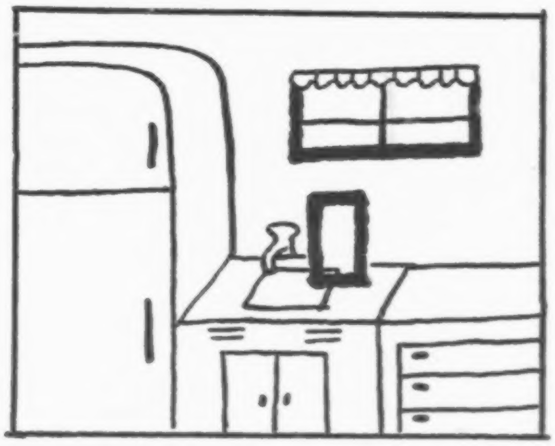

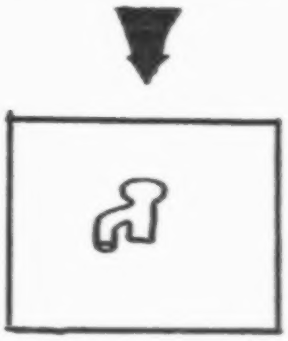

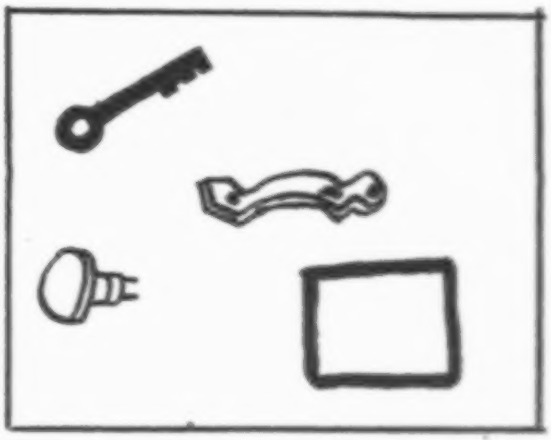

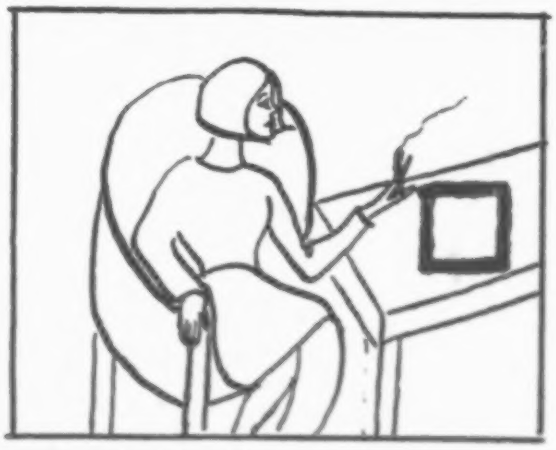

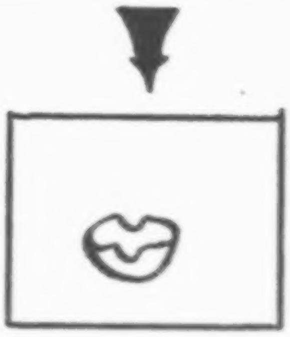

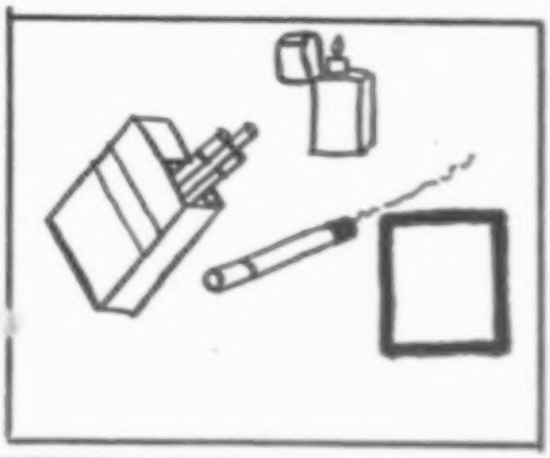

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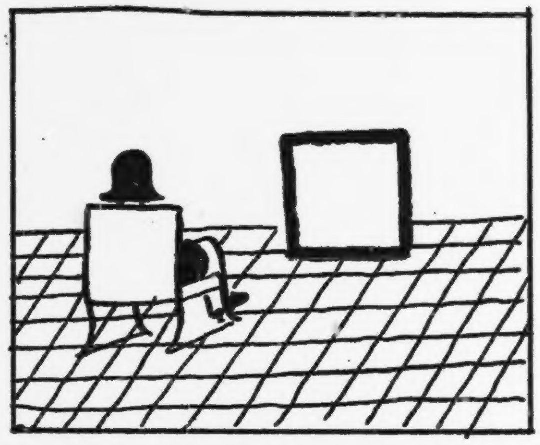

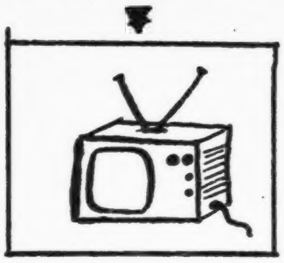

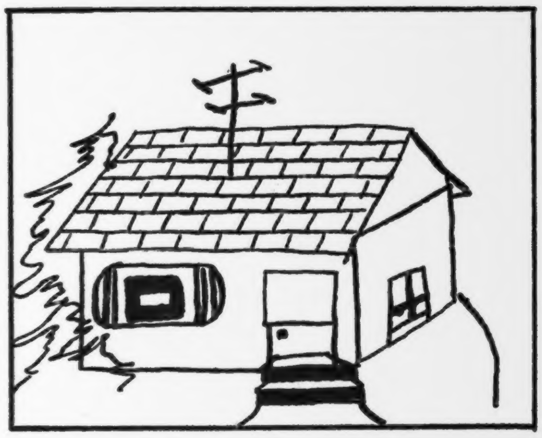

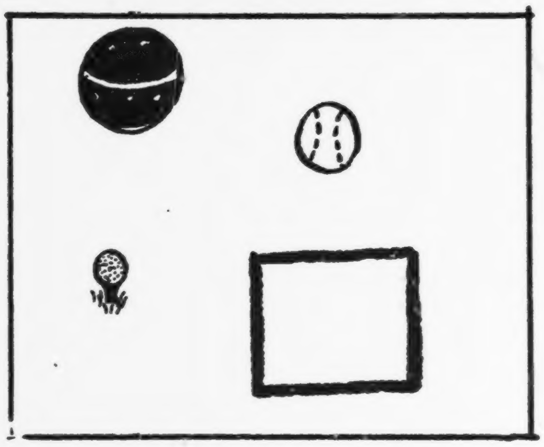

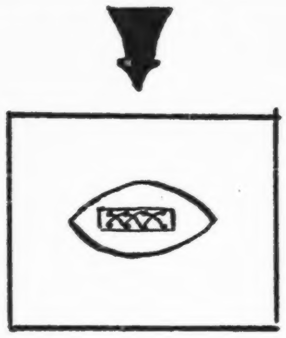

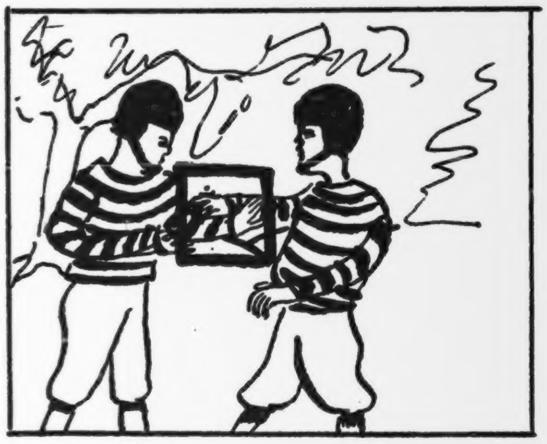

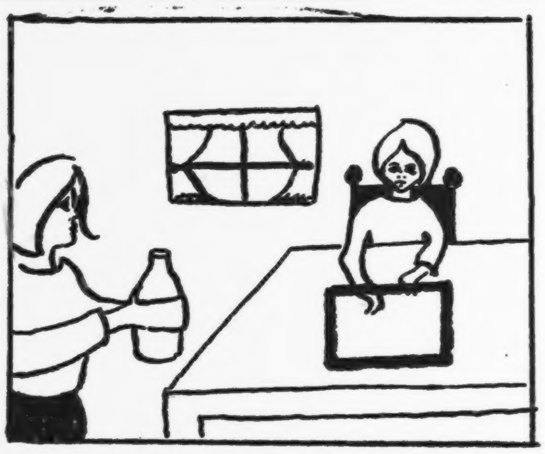

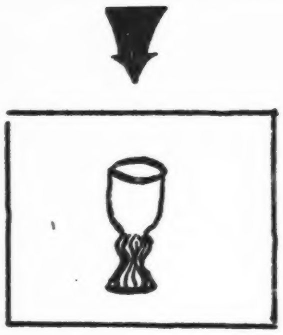

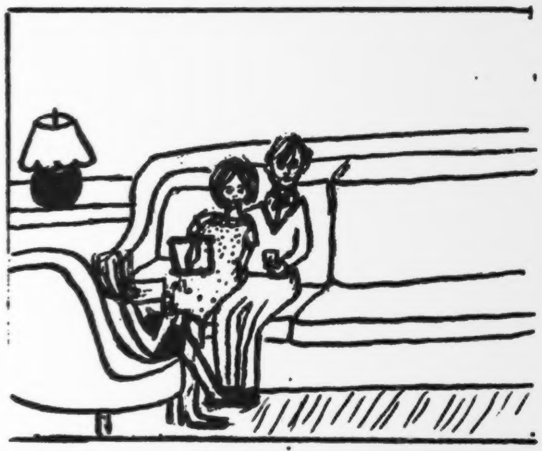

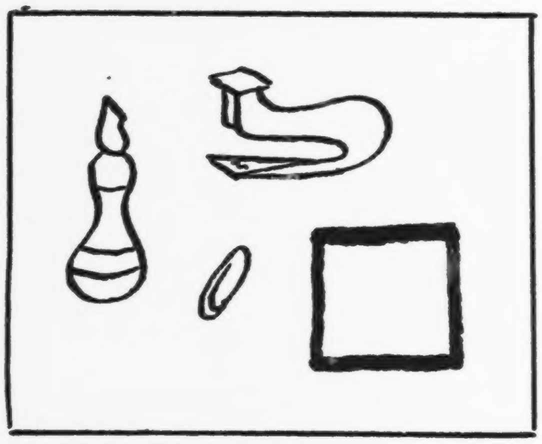

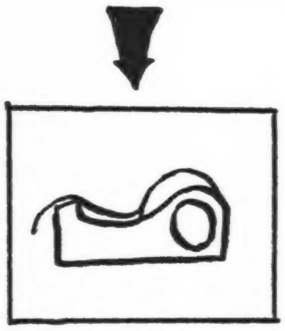

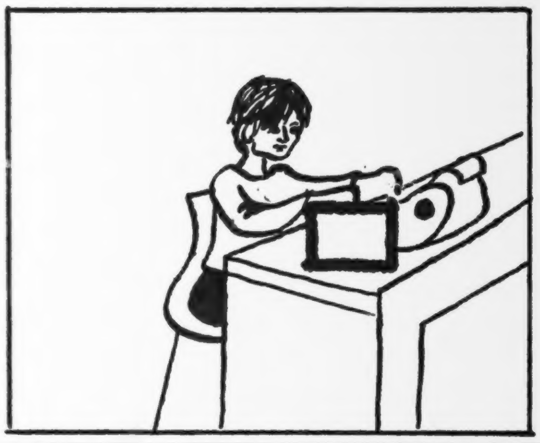

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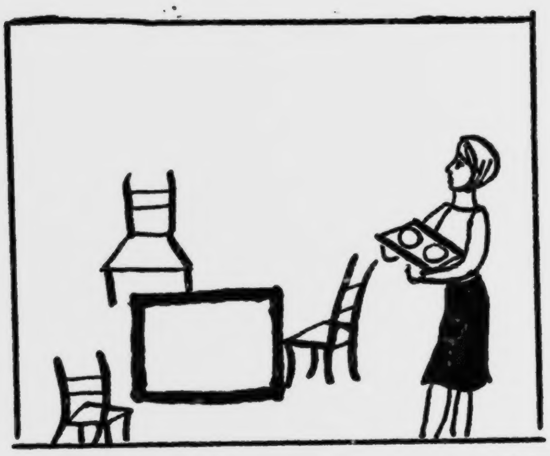
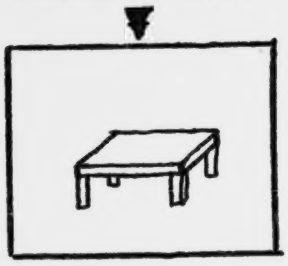
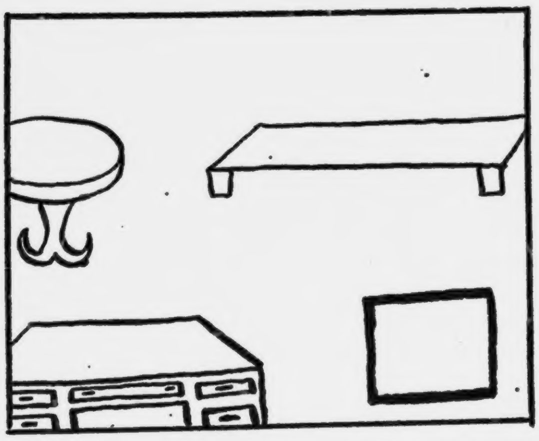
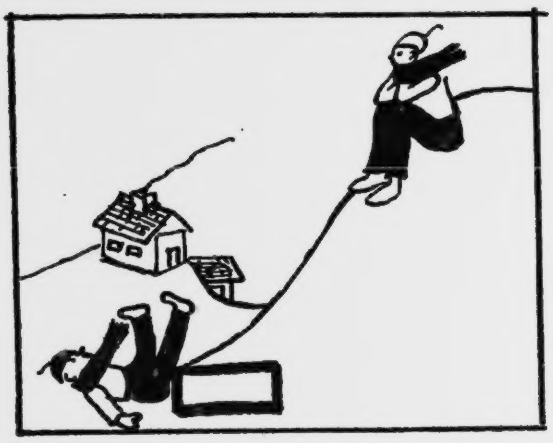
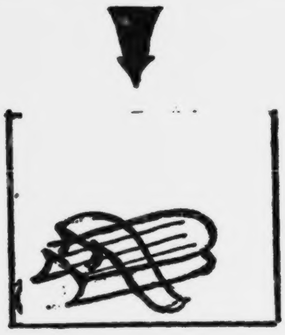
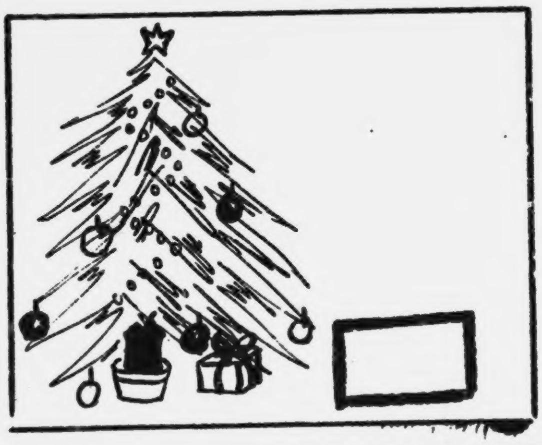
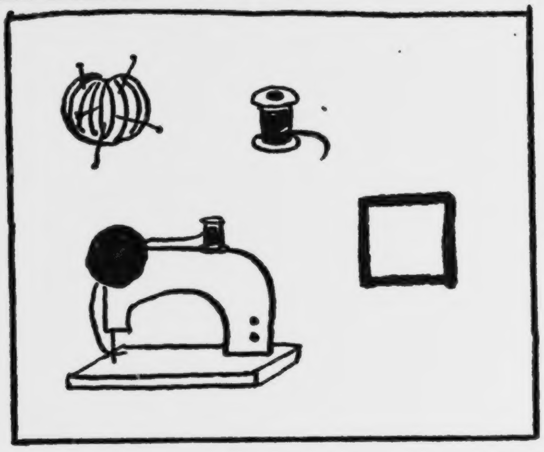
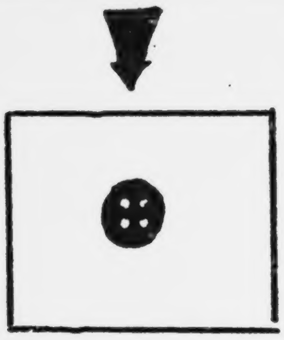
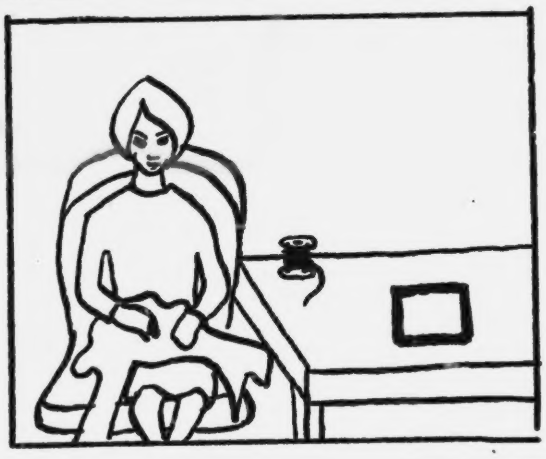
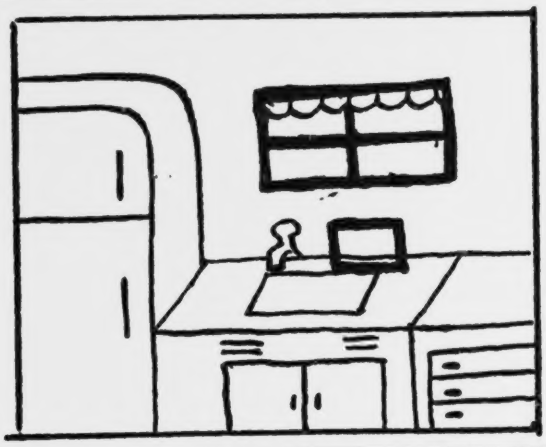
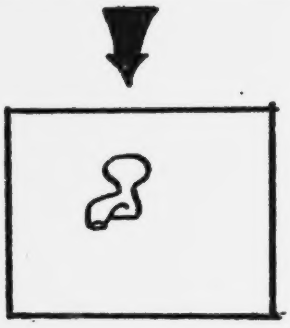
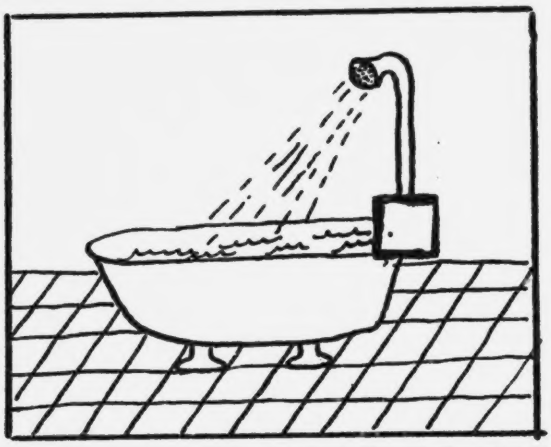

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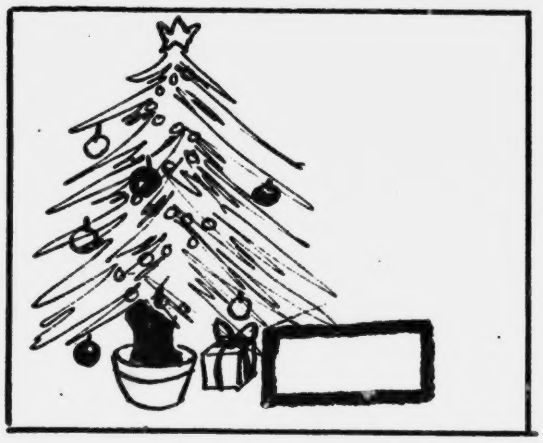

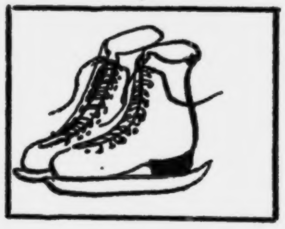

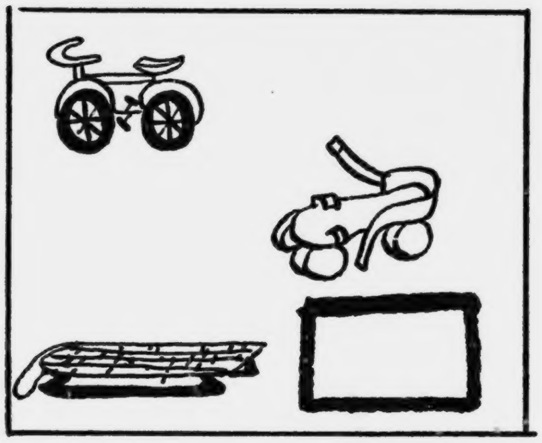

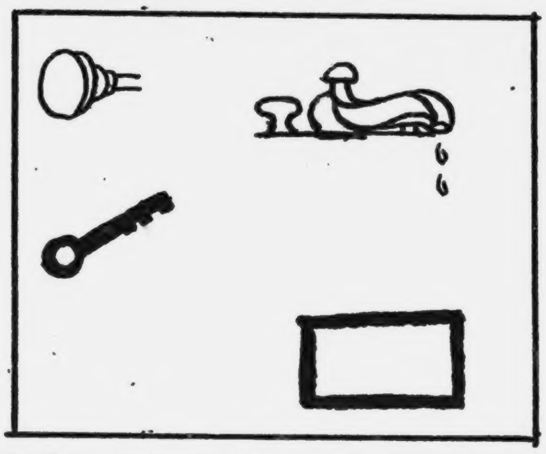

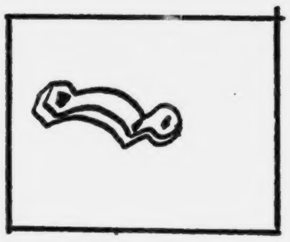

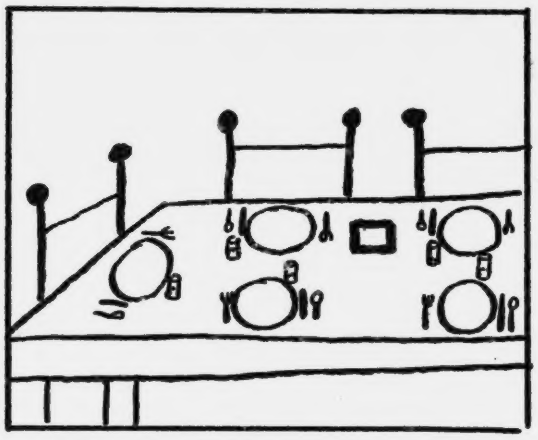

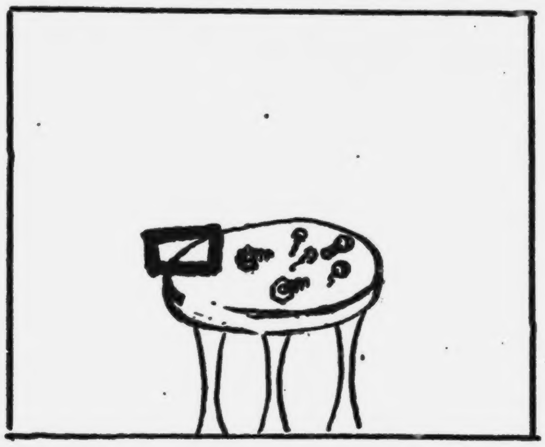

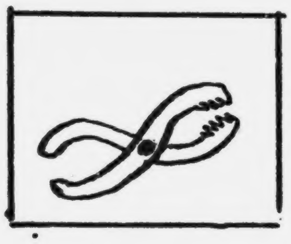

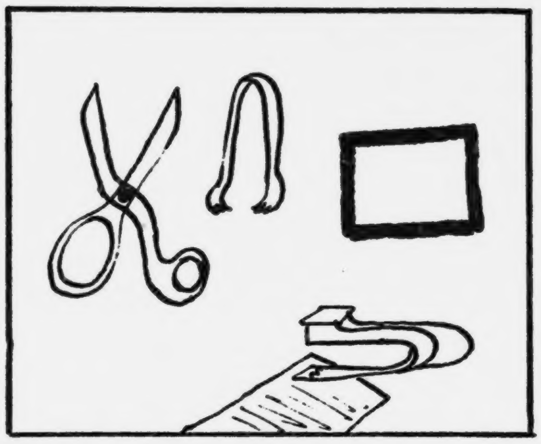

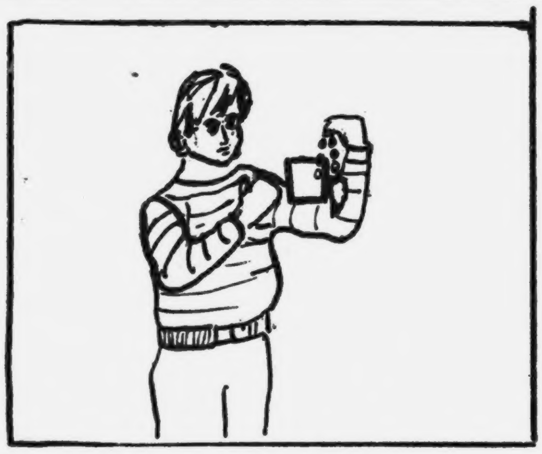

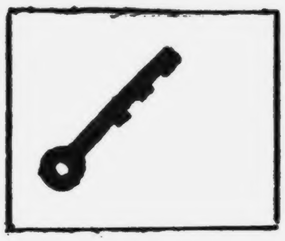

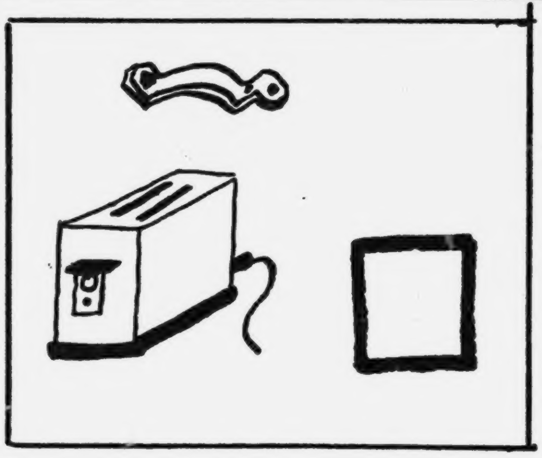

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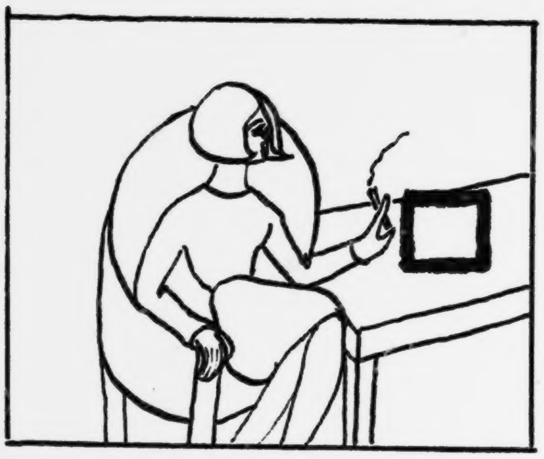

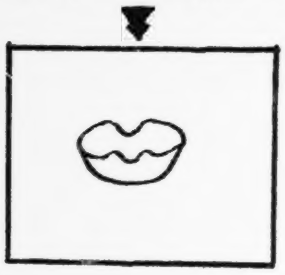

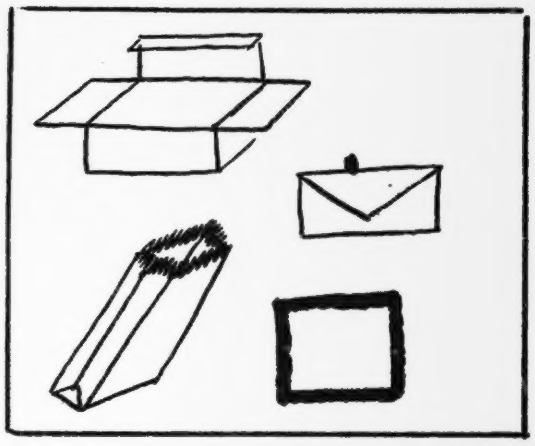

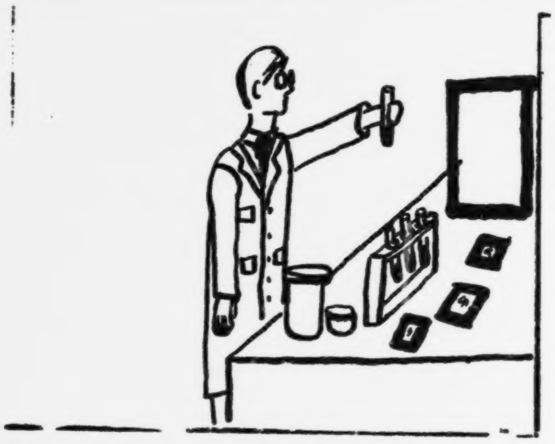

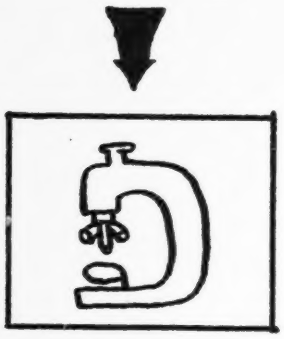

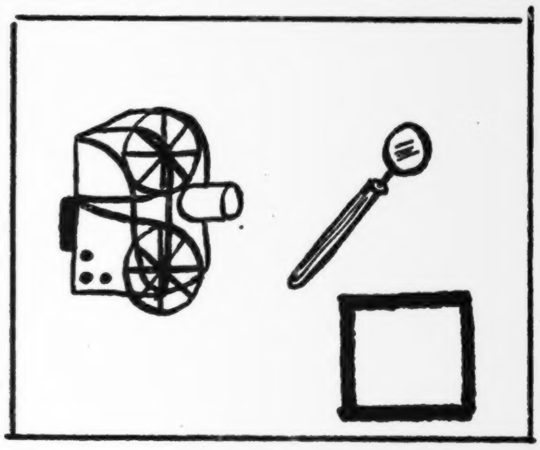

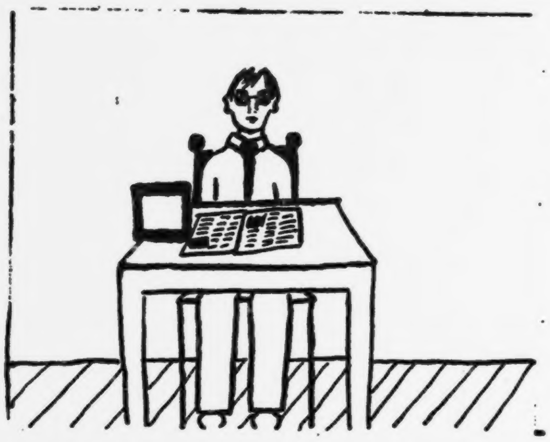

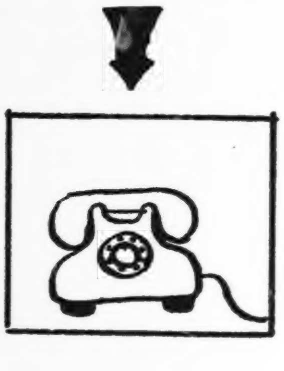

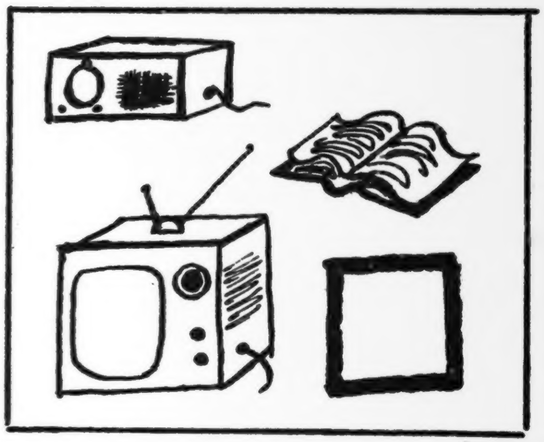

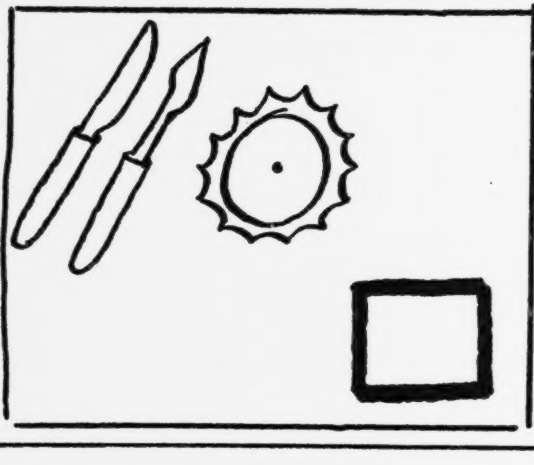

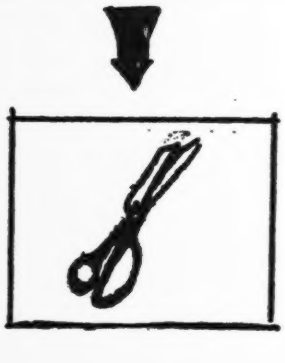

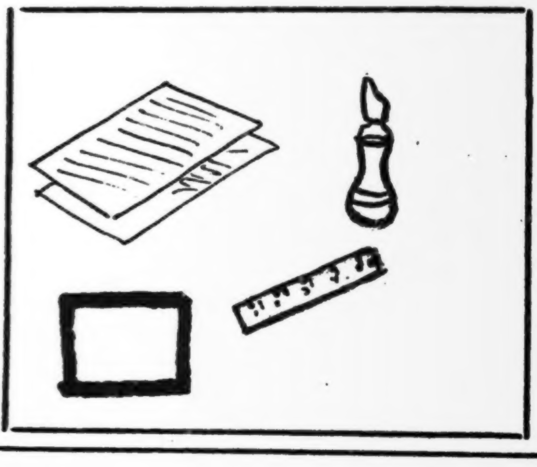

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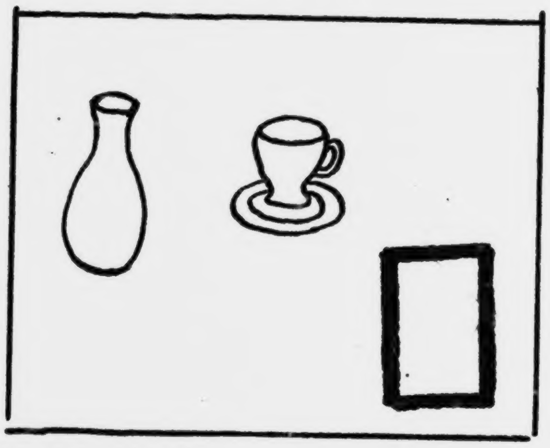
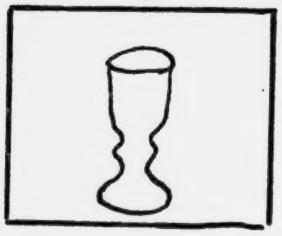
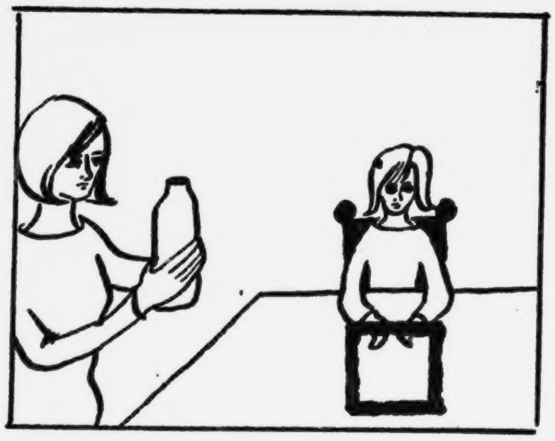
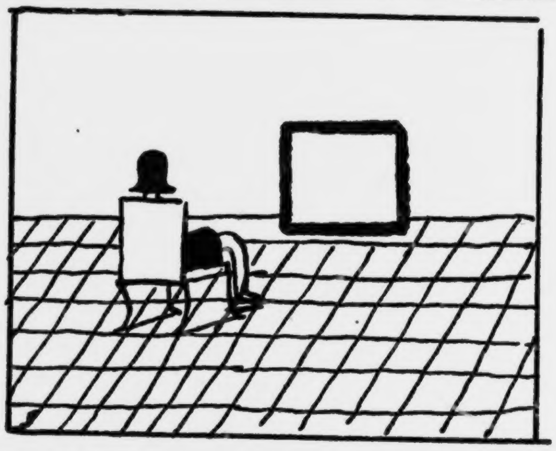
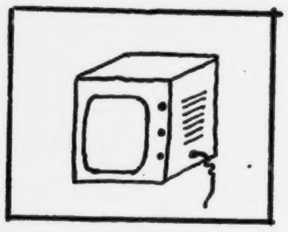
PUT AN X IN THE BOX WHERE THE PICTURE BELONGS.

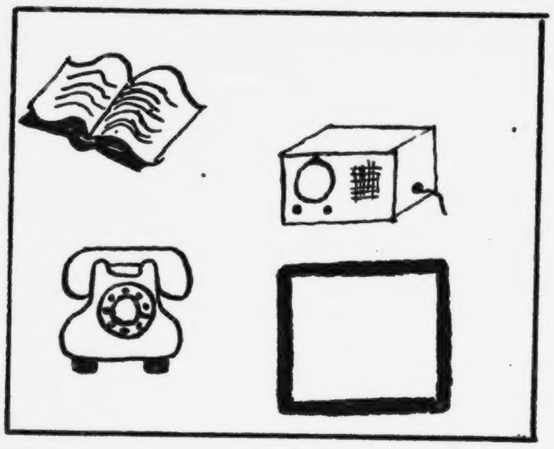


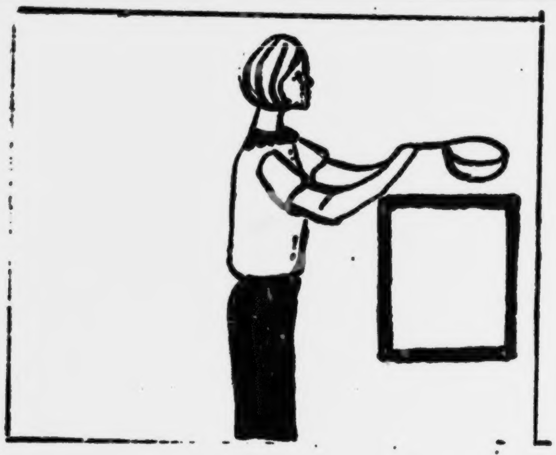


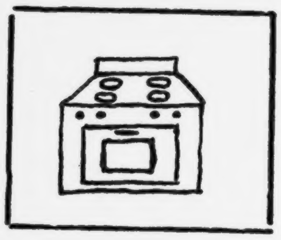


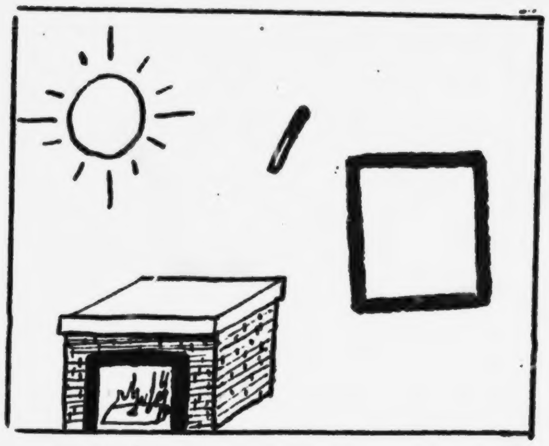


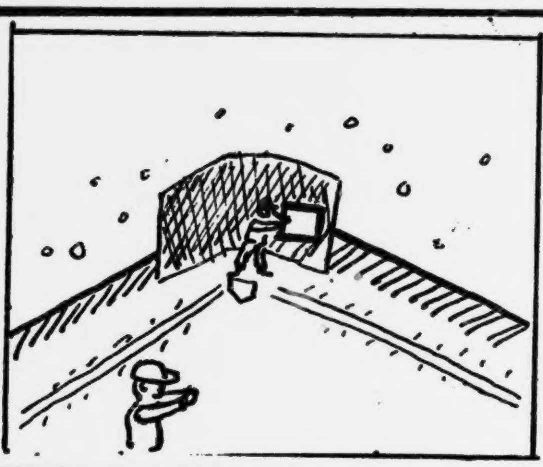


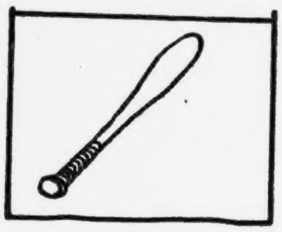


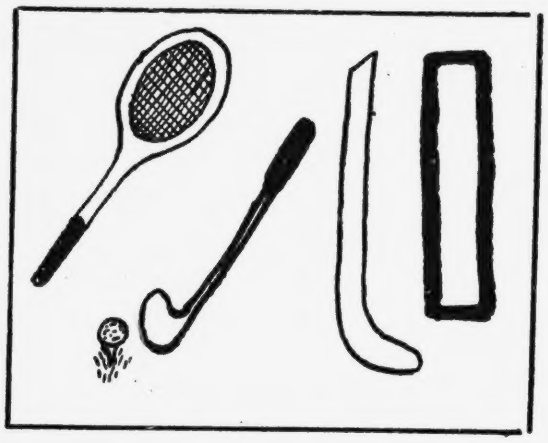












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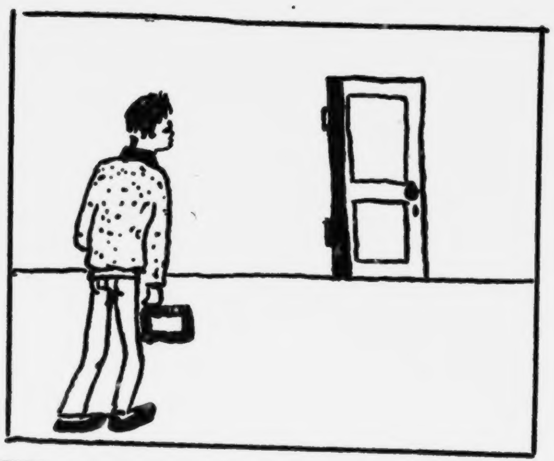

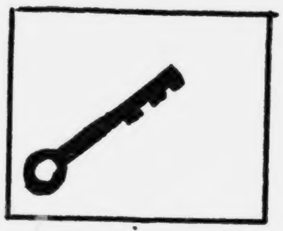

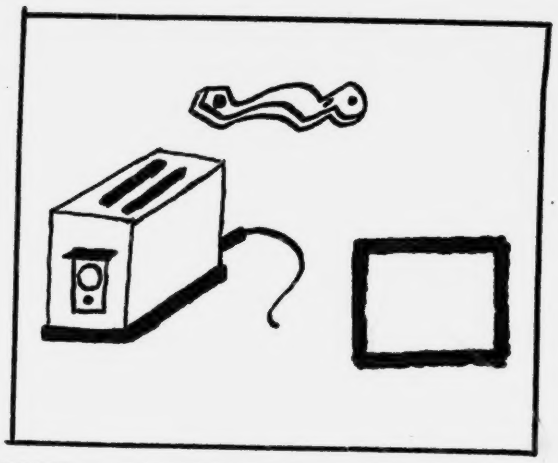

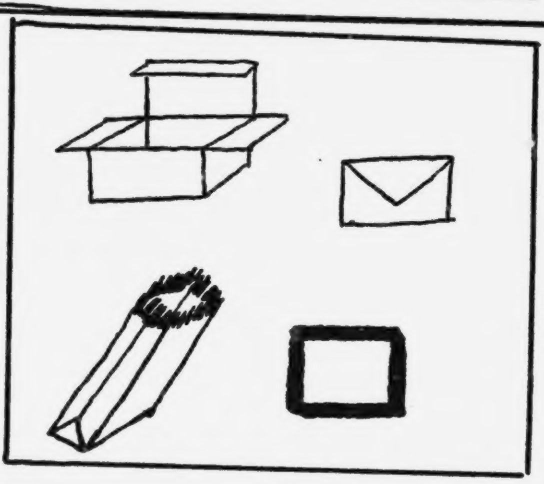

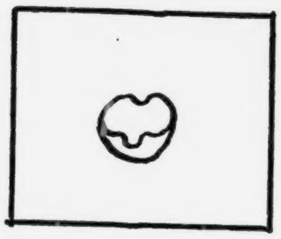

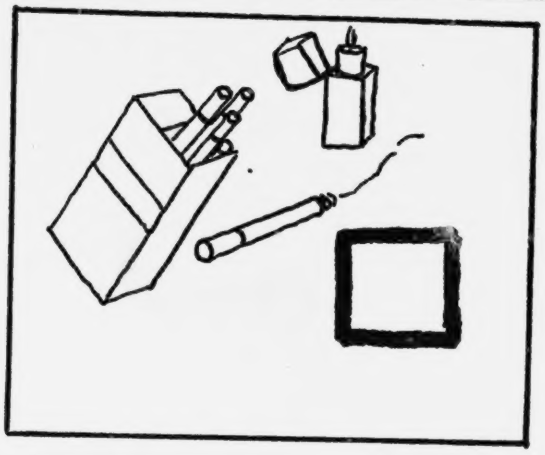

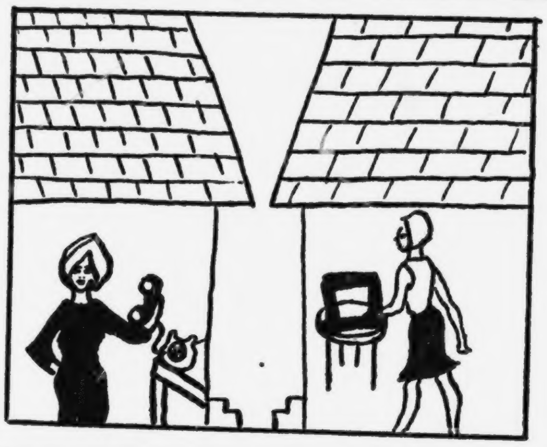

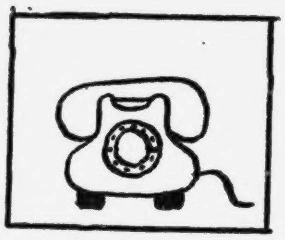

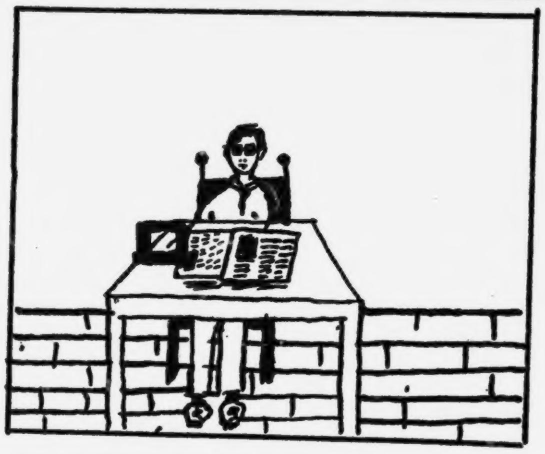

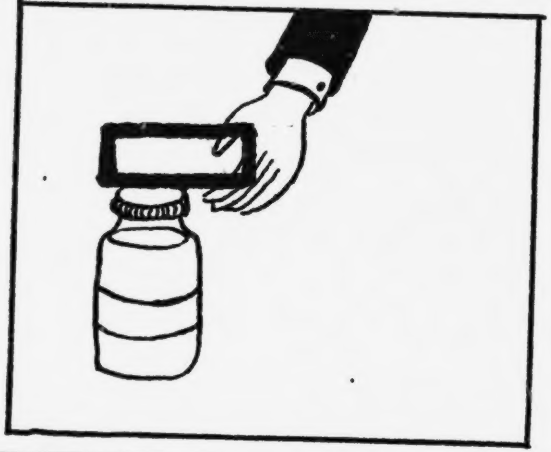

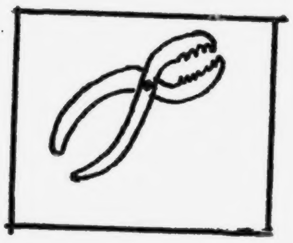

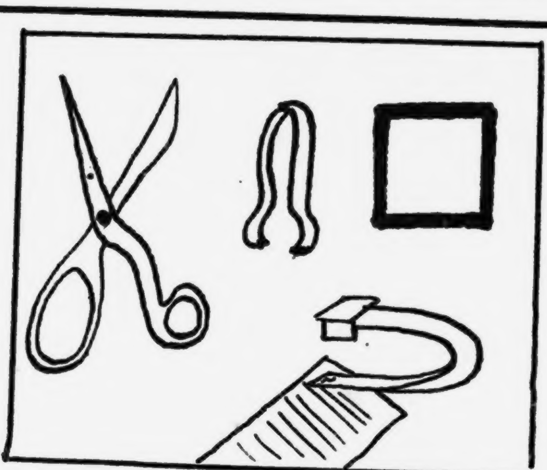

LOOK AT THE PICTURE
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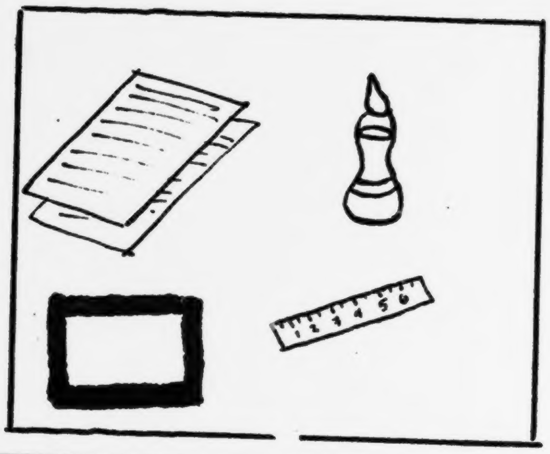

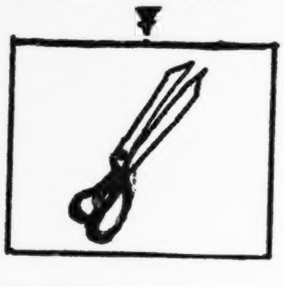

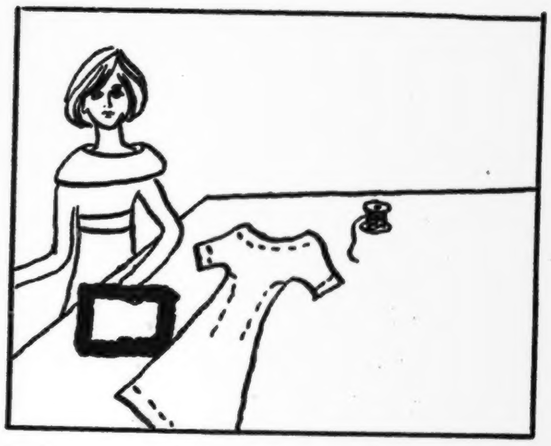

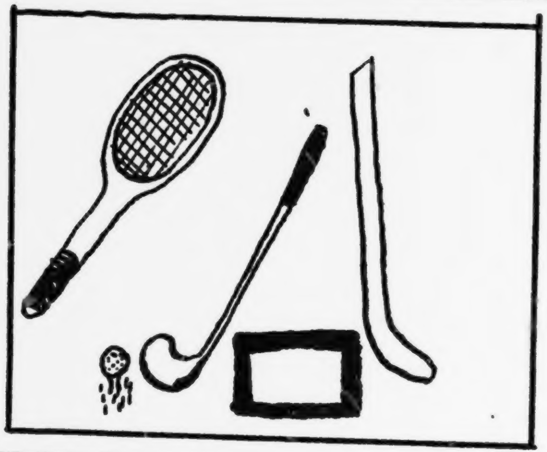

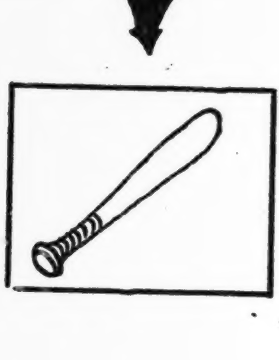

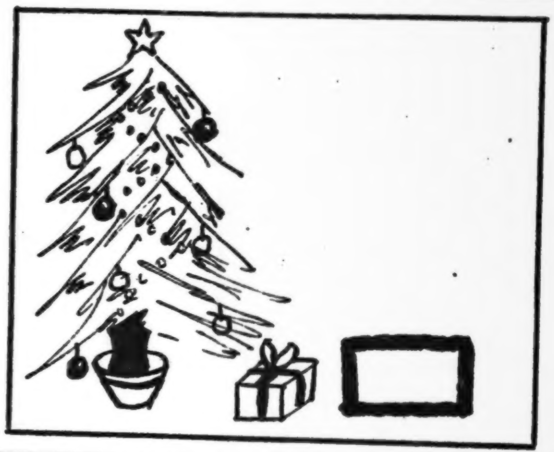

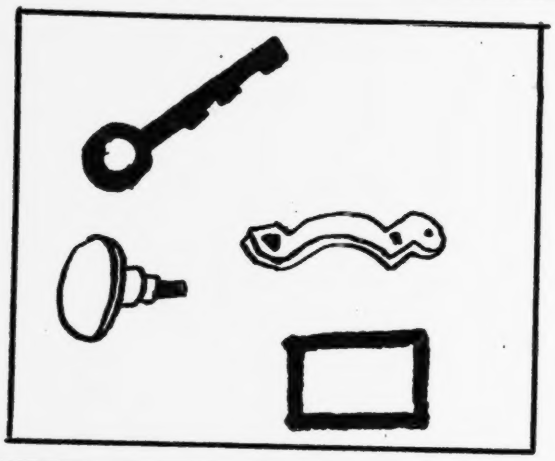

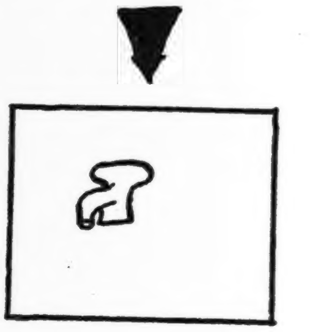

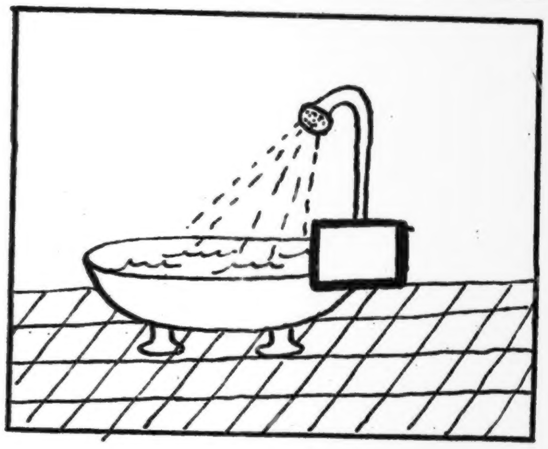

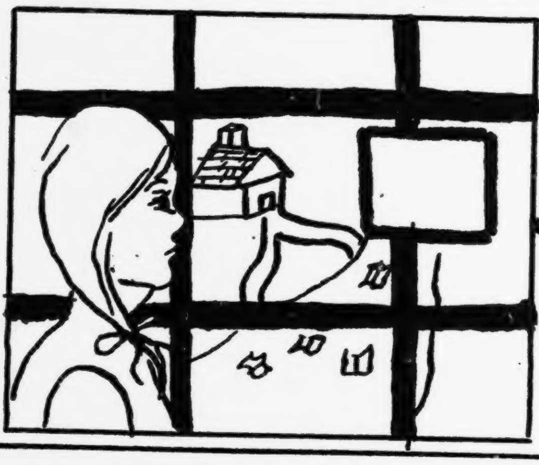

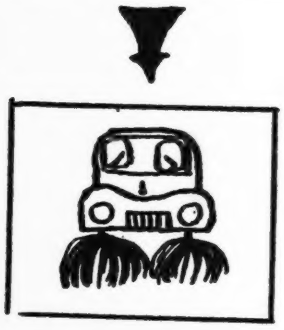

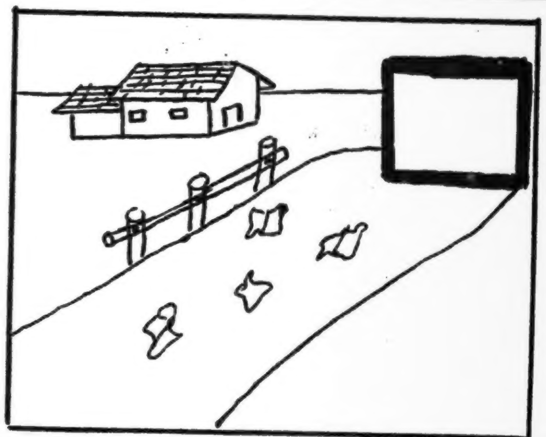

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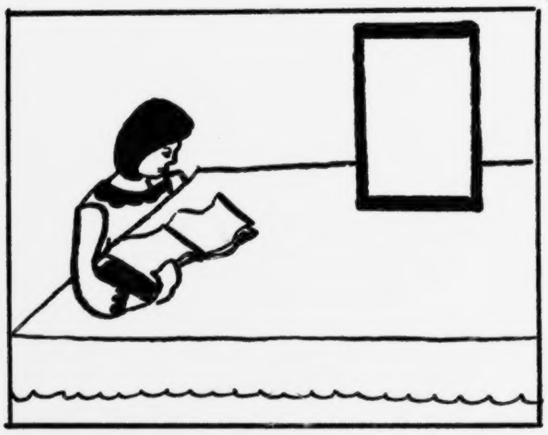

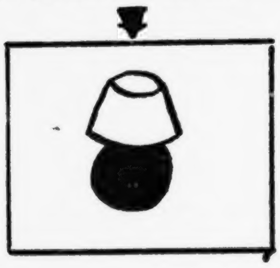

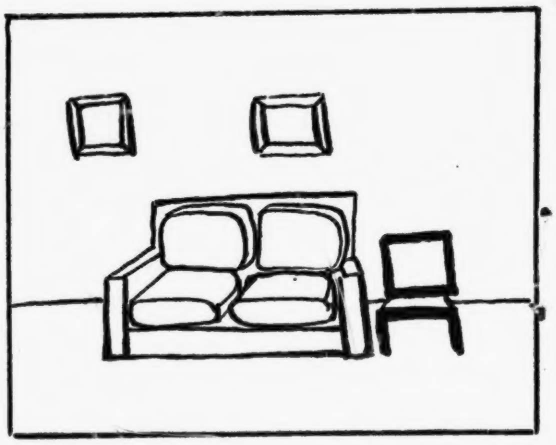

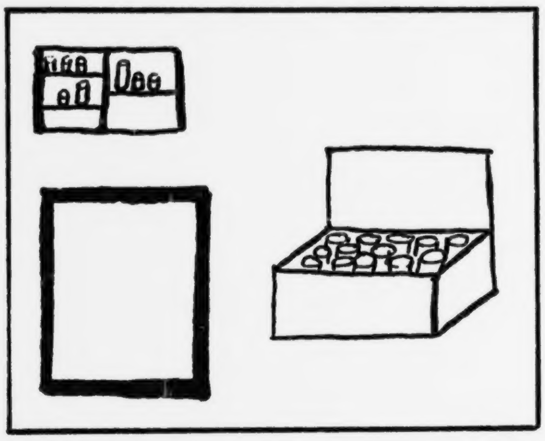

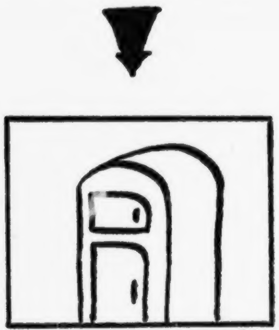

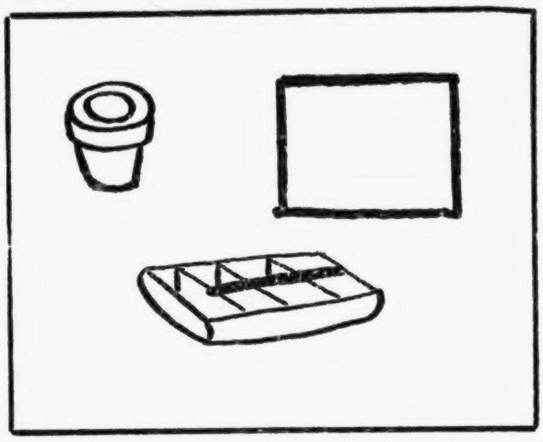

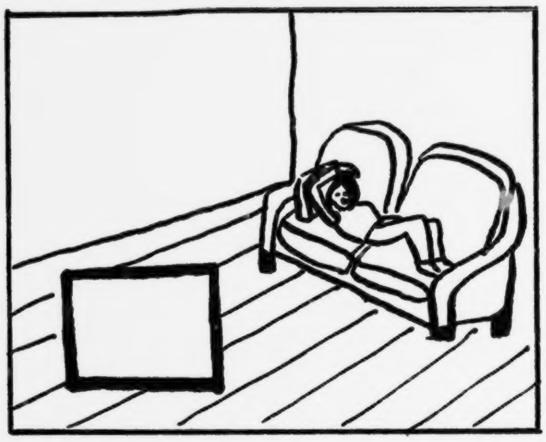

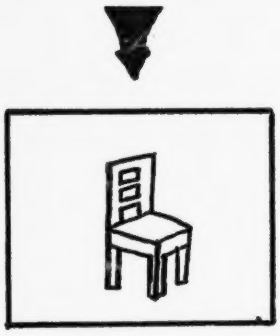

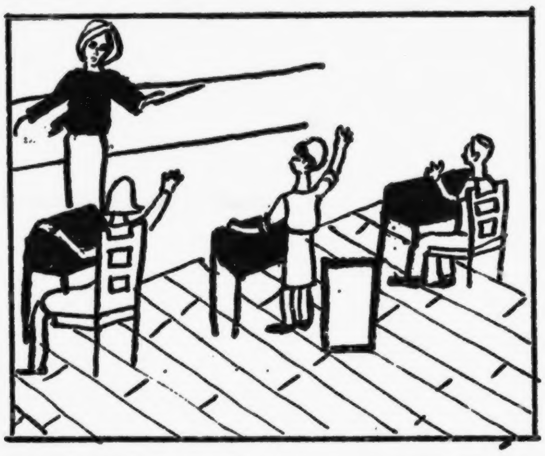

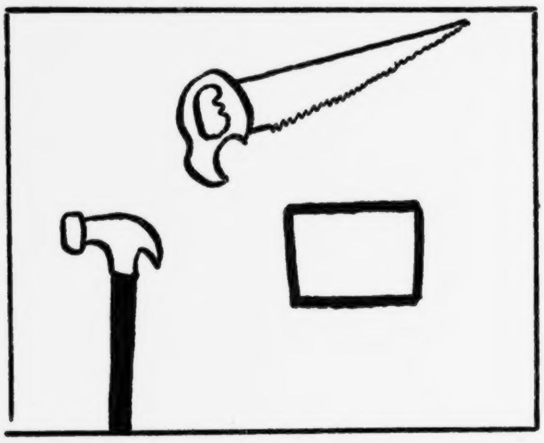

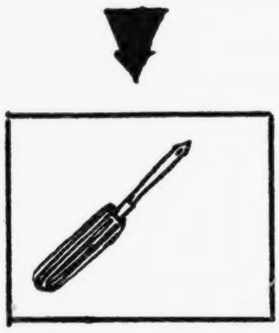

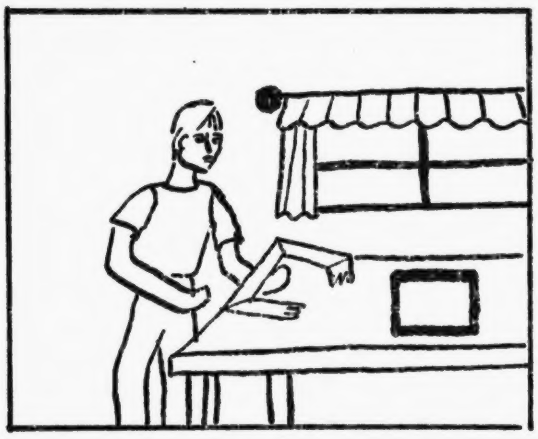

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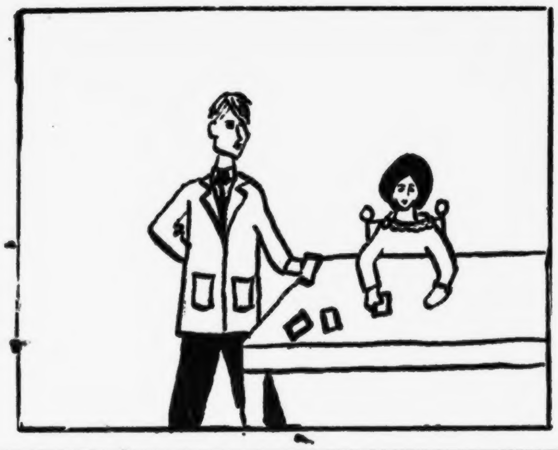

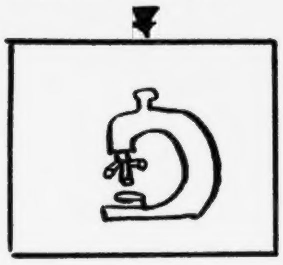

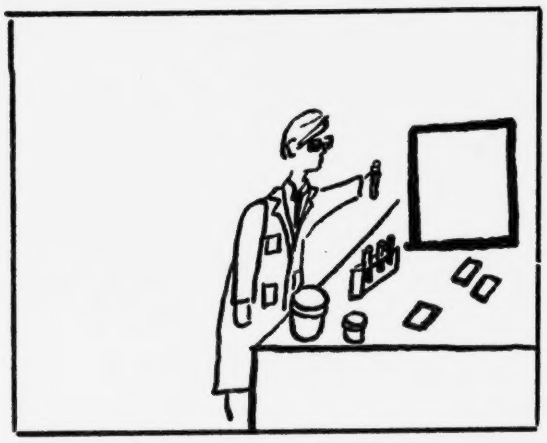

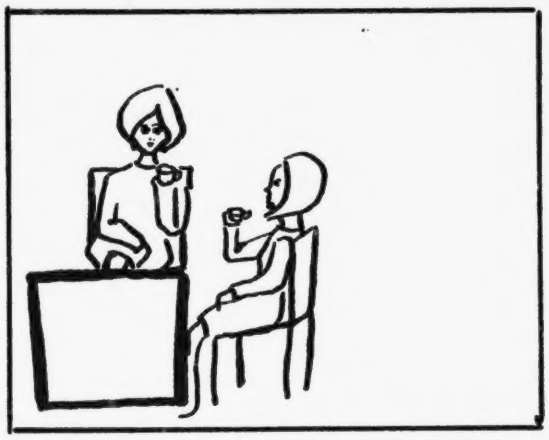

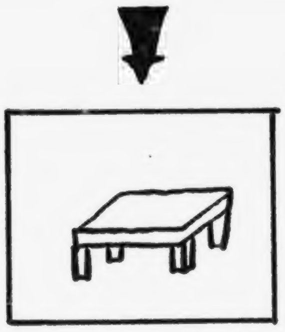

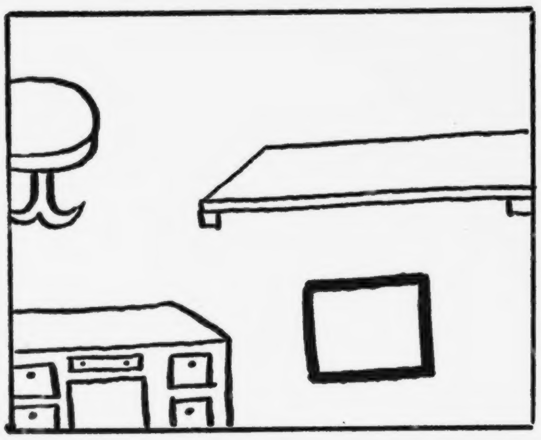

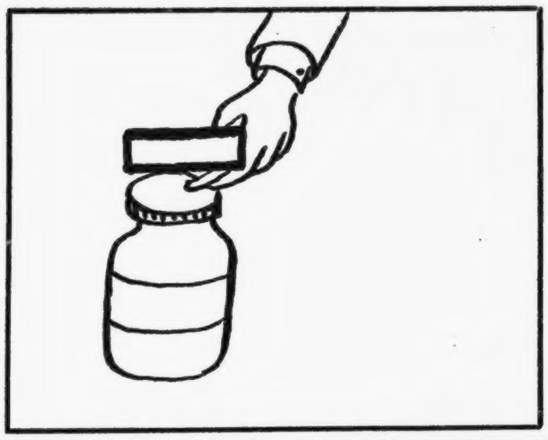

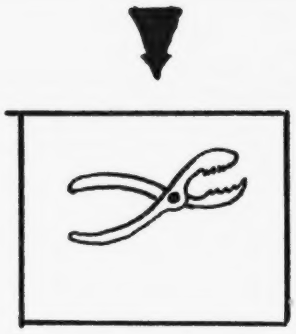

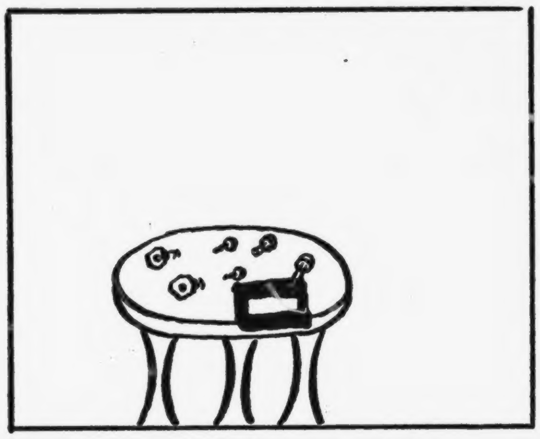

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